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THE LATE Mr. FRANK WRAGG, F.R.C.V.S.

F. W. Wragg, F.R.C.V.S., born 1840. Graduated London, 1861. Died August 4, 1908.

The tragic suddenness of the death of Mr. Wragg came as a shock to the whole of the veterinary profession, for few men had a larger circle of professional acquaintances, and certainly no one was more respected. A devoted and earnest worker in all directions which would be likely to raise the dignity of the profession, he was ever ready to give time and take trouble to further this end, and as a sign of his popularity it may be mentioned that he had at one time or another been selected as President to no less than five different veterinary societies—viz., the Central, the Royal Counties, the Midland Counties, the Eastern Counties, and the Southern Counties. At the Council of the Royal College of Veterinary Surgeons he was one of the most regular attendants, occupying the Presidential chair in 1893, and for the past twenty-five years he has faithfully conducted the financial affairs in the capacity of Treasurer. A still further proof of the confidence placed in him was his election to the Treasurership of the National Veterinary Association, and at the recent meeting of this Society at Brighton his genial presence was universally missed.

The confidence extended to Mr. Wragg by his professional brethren was equally shared in other quarters, and he will be greatly missed by a large circle of clients who trusted him absolutely, and to whom his opinion was final. Belonging to two of the oldest City Companies, the Butchers' and the Farriers', he was elected Worshipful Master of the former, and in the latter occupied the position of Judge at most of the examinations and horse-shoeing competitions, whereby all over the country attempts are being made to raise the status and improve the art of the farrier. On the Council of the Royal Society for the Prevention of Cruelty to Animals he was an active member, his aid being sought in many ways and his advice freely given when serious consequences were at stake. His

death occurred whilst he was on a professional round of visits, quite suddenly, from heart disease.

At the funeral, which took place at Hampstead, amid many expressions of profound sympathy with Mrs. Wragg, the Council of the Royal College of Veterinary Surgeons and numerous veterinary associations were represented.

Editorials.

THE NATIONAL VETERINARY ASSOCIATION.

THE annual meeting for 1908 is now a thing of the past, and it may do good for us to reflect upon it for a while. On the whole, it was a great success; the papers provided much useful information, and afforded grounds for very instructive discussions. The discussions were so well maintained that unfortunately they had to be closed before a number of members wishing to speak had the opportunity of joining in, and others, in making their remarks somewhat hurriedly owing to lack of time, omitted some of the points they intended to make. It is a great pity that this Association, the most important in the country, and which only meets once a year, should be cramped for time. The best results and the greatest advantage cannot possibly be obtained under such conditions, and it may be advisable to look for some remedy. We agreed with the able and genial President (Mr. Roberts) when he hinted at the advisability for considering the extension of the meetings over another day. Most members would, we feel sure, be quite agreeable to the change. Even under the present conditions many members stay a few days after the meetings are over. It has already been pointed out that the American Veterinary Medical Association devotes four whole days to the discussion of scientific subjects. That being so, surely the most important veterinary association of the United Kingdom can afford three days for the same purpose.

Another possible remedy suggested by the President is one in vogue at many of our local associations, and that is the application of a time limit to the speeches of members. We are of opinion that this is desirable in any case, the meeting reserving to itself the right to vote an extension of time in any particular instance.

Few things are more wearisome than listening to some loquacious gentlemen who appear to talk round the subject for a long time without actually coming to the point, though we do not suggest that such a thing occurred at the last meeting, where all the speakers seemed anxious to get directly to the point. It is the latter fact that made it more unfortunate that the discussions had to be curtailed. If the openers of the discussions were allowed a maximum of twenty minutes for their tasks, and following speakers ten minutes, with rare exceptions as suggested above, we believe the discussions could usually be brought to natural conclusions. Such a time limit is quite practicable when the papers are printed and circulated in advance, and members have the opportunity of reading them at their leisure, and being prepared with the observations they wish to put forward. The matter, however, is one which we can safely leave in the hands of the Council of the Association. No doubt they will consider the matter, and decide whether and what change is desirable.

The social aspect of this year's meeting was quite as successful as any of its predecessors. Brighton, through the Mayor, gave us a cheery welcome; the weather was excellent, and the lady members (if we may so call them) were charming. Then every arrangement for our comfort and enjoyment had been carefully made by Mr. Roberts and his hard-working lieutenants, Messrs. Burt, Stuart, Todd, and others. The reception given by the President and his daughter, who so admirably represented Mrs. Roberts, was most enjoyable, and the memory of the delightful excursion to Arundel Castle and up the River Arun to Amberley will long be retained by those who were fortunate enough to be present.

The one sad note was the absence of our universally respected and lamented treasurer, Mr. Wragg, who had been looking forward to within a few days to the Brighton meeting. His genial face and kindly hand-shake were sadly missed.

UNIVERSITY VETERINARY EDUCATION IN GREATER BRITAIN.

IT is a sign of the times that veterinary schools are becoming affiliated with Universities, not only in Great Britain but also in Greater Britain, and this year will see two more such changes.

The Veterinary College of Ontario has recently been taken over by the Government and affiliated with the University of Toronto and the University of Melbourne in Australia has also decided to add a Veterinary Faculty and to equip laboratories and furnish the necessary buildings for teaching veterinary science.

When managed properly there is no question but that such additions to the Faculty of Medicine are of mutual benefit, for not only is it of benefit to the veterinary profession to have the hall mark of the University upon the degree conferred, but it can be made of equal benefit to those who battle with human diseases, so many of which can be studied with advantage from the comparative aspect.

Every medical University cannot have a Veterinary Faculty attached to it, the cost of up keep being too great, but each could without exorbitant cost have a chair of Comparative Pathology, this to be filled either by a veterinary surgeon or one who holds the double diploma. The advantages are too obvious to mention, for a comparison between the lesions of almost any disease which is common to man and animals will completely do away with many wrong theories and put the investigator on another line of thought ; perhaps, who knows, the one which leads to success.

Take for example the relative frequency of the presence of cirrhosis of the liver, the commonest cause of which used to be asserted by practitioners of human medicine to be the over-indulgent use of alcohol. Members of the veterinary profession know that a cirrhotic liver is met with very commonly on *post-mortem* examination of animals, especially the canine species. They however, are not alcoholic. The recent researches into cancer, even if a cure has not resulted, have done more towards negativing old-fashioned and incorrect theories by work done from a comparative aspect than in any other way, and it must always be of advantage to the investigator of any human diseases to be able to compare notes with an intelligent collaborator whose life study has been the progress and treatment of the same disease in one or more species of the so-called " lower " animals.

General Articles.

POLL EVIL AND FISTULOUS WITHERS.

BY W. L. WILLIAMS, PROFESSOR OF SURGERY IN THE NEW YORK STATE VETERINARY COLLEGE, CORNELL UNIVERSITY.

It is not easy to give a comprehensive definition of poll evil or fistulous withers, because a variety of conditions are included or excluded under this term by various veterinarians. Many veterinarians limit the application of these terms to the existence of a fistula opening upon the poll or withers respectively, but this is not always correct, because the fistulous opening in the disease of the poll may be on the forehead, the fistula traversing the occiput to reach the sub-ligamentous pus cavity, while, on the other hand, there is little essentially clinical difference between an abscess and a fistula of the part, the former regularly leading to the latter condition, so that the difference is chronologic rather than pathologic. Quite aside from abscess of the poll or withers, but, when opened or otherwise infected, tending constantly to the formation of a fistula, is the lymphoma (or hematoma) of these parts. We would consequently define our title as "a fistula, or any pathologic condition ordinarily tending to result in a fistula, of the poll or withers."

Clinically, the affection is confined to the horse, though, technically, abscesses and fistulæ of these parts may occur in any animal. We have observed one such instance in the withers of a cow.

In economic importance, these affections, which we shall consider as one disease, interchangeable in location, occupy an important place in equine surgery. In our clinic, amongst 5,367 surgical and obstetrical cases in the horse, there occurred 145 cases of poll evil and fistulous withers, which amounted to 2·7 per cent. of the total number entered. The statistics of the Veterinary High School of Berlin for the two years from April 1, 1903, to March 31, 1905, show for the polyclinic, including abscess and fistula of the withers and poll, sixty-one cases among 14,566 horses handled for external (surgical) diseases, or 0·42 per cent. If we turn to the surgical clinic for horses in the same institution and for the same period, the percentage of this affection becomes higher, there being thirty-four cases among 1,714 horses, or 1·91 per cent. Apparently the cases handled in the surgical clinic for horses may be largely or wholly included in the cases occurring in the polyclinic. At least the polyclinic at Berlin, with its 0·42 per cent. of poll evil and fistulous withers, corresponds closely in character with our clinic showing 2·7 per cent. cases, which indicates that, given an equal number of horses affected with "external" diseases, our clinic would show six or more cases of fistulous withers or poll evil to each one in the Berlin clinic.

The prevalence of poll evil and fistulous withers varies widely in different localities, and a study of its geographical distribution is highly interesting. We have indicated above that in our clinic the cases amonnt to 2·7 per cent. of the total number of horses, as against 0·42 per cent. in the corresponding polyclinic of Berlin. The variations between different localities in America is equally great. It is

a rural rather than an urban malady. While no statistics except those above quoted are available, it is a common experience and observation in America that there is a vast preponderance of cases in the country as compared with the city. Two considerations may modify these observations. First, the occurrence, even rarely, of the disease in large cities may possibly be accounted for sometimes by importation from the country, indicating that in some instances the foundation for the disease was rural, that the infection had occurred in the country, the patient taken to the city apparently sound and later developed the malady. Secondly, it may be that there is a greater percentage of "external" or "surgical" maladies, as compared with the "internal" or "medical" diseases in the city than in the country, though we believe the reverse to be true. Whatever may be the facts in the case, it remains that the malady is chiefly rural.

In rural communities, however, the prevalence of the disease varies greatly in different sections, and at various times. In our own clinic, cases are drawn from a radius of 12 to 20 miles, but there is a very marked variation in the prevalence of the disease in the different portions of this area. There is a "fistulous withers and poll evil" patch, comprising probably one-eighth of our area of patronage, and furnishing perhaps 50 per cent. of our cases. On one farm in this region having five horses, three contracted poll evil and two fistulous withers within two or three years. On another farm with three horses, one had poll evil and fistulous withers, one poll evil, and one fistulous withers within a year. There is nothing visible about the locality to suggest such a condition. The section is well drained, productive, and the stables comparatively good. Apparently, it is one of the best portions included within our area of patronage, and, so far as can be determined, the animals have good care.

The writer has observed similar occurrences in Illinois and Montana—countries radically different in soil, climate, food, and the housing of horses. In the area from which our clinic draws its cases, horses are closely stabled; practically all of them are quite constantly stabled during the winter, and most of them are kept stabled during the summer. In Central Illinois unworked horses are mostly entirely free at pasture during the summer, and only a part of them stabled at night during the winter, while in Montana stabling was generally limited to work horses. Yet in the two latter States there occurred "poll evil and fistulous withers" patches. So we have observed in Illinois outbreaks of fistulous withers and poll evil on breeding farms —farms which had not had a case during the twenty to fifty years since it was brought under cultivation, and then suddenly an outbreak of four or five cases would occur among fifteen or twenty unworked animals in the pasture, after which the disease would vanish as suddenly and mysteriously as it came.

In Montana it is not usually seen at all, at least we failed to see a case amongst range horses—that is, animals which were allowed to roam free in the foothills and mountains without handling or housing, and procuring their entire sustenance from the open range; while on certain farms in the valleys, where the horses were confined in pastures and fed on hay or straw, and possibly some grain during winter, but not necessarily stabled, the disease occasionally appeared in a number of horses simultaneously.

PATHOLOGICAL ANATOMY.

The pathological conditions vary widely. In our definition we included a variety of conditions. This carries with it some variation in the location of the disease itself.

In *poll evil* we may recognize four basic conditions :—

(1) A supra-ligamentous ulcer or abscess, accompanied by a cutaneous lesion—false poll evil.

(2) Distension of the sub-ligamentous bursa, with serum or lymph —serous poll evil.

(3) Abscess of the sub-ligamentous bursa.

(4) Fistula of the poll, the fistulous tract extending from the exterior into a pyogenic sub-ligamentous cavity of variable extent and direction.

Our class 1 is rare. We have observed but a single case, which was seen in private practice, and is not included in our clinical statistics. The condition consisted simply of subcutaneous abscess of the poll, accompanied by necrosis of the skin, without involvement of the subjacent tissues. This class might well be quite detached from the three following groups, is surgically unimportant, and economically negligible.

Classes 2, 3, and 4 have a common seat. Some anatomists describe a sub-ligamentous serous or mucous bursa between the axis, or atlas and axis, and the cordiform portion of the neck ligament ; but it seems that this cavity is pathological or semi-pathological, absent in the young, and acquired in some old animals, but not in all. It is here that the point of origin of the last three groups is located.

Class 2 is very significant, since it is frequently the forerunner of classes 3 and 4, possibly regularly precedes them, without becoming, in most cases, clinically recognizable. In our area, examination of the polls of aged dissecting subjects reveals a prevalence in a large percentage of cases, perhaps 50 per cent., of three significant conditions :—

(*a*) The existence of the bursa.

(*b*) A moderate distension of this bursa, with 1 to 2 or more ounces of a pale yellowish or yellowish-red liquid.

(*c*) Calcareous degeneration of, or deposits in, the walls of the bursa and in the neck ligament.

The calcareous deposits are most common on or in the inferior surface of the ligament, but are not infrequent in the floor of the bursa, and these may extend deeply, invade the cervical vertebræ or occiput, causing or accompanied by periostitis and ostitis with exostosis, necrosis or anchylosis. The calcareous deposits also invade, though less commonly, the lateral walls of the bursa, involving the adjacent tendons or even the muscular tissue of the splenius and complexus muscles. The sub-ligamentous cavity being opened, the calcareous masses are best recognized by touch, as hard, irregular masses, usually varying in size from $\frac{1}{16}$ to $\frac{1}{2}$ in. in diameter, but may be larger or smaller. They are very irregular in outline, and frequently present rough or sharp edges, projecting into the cavity. They are firmly imbedded within the tissues and inseparably fixed therein, so that they can only be removed with portions of the soft tissues. The calcareous masses vary in hardness ; some may be rather easily cut through with a scalpel, others are dense and highly

resistant. When cut through, or when exposed to view, the masses are greyish or brownish-yellow in colour. The lining membrane of the sac is usually somewhat congested and reddish in appearance. From this condition—which is in itself pathological, but clinically unrecognizable—it is but a step to the clinically recognizable serous poll evil, in which case the change in pathological condition consists of quantity rather than quality. The amount of serum is increased, causing a visible and palpable distension; the sac membrane is increased in thickness, its walls are more congested, and the calcareous deposits probably more numerous and of larger size.

Such condition may cause little inconvenience to the patient beyond a rigidity of the cephalo-cervical articulation, and may continue unchanged in aspect for months or even years; more rarely, it may partly disappear, but generally, after a duration of some weeks or months, suppuration of the sac occurs, and there is established our third class, or abscess of the poll. The serous poll evil, or lymphoma of the poll, forms a dense, resistant, elastic sac, its exterior uniformly resistant over its entire surface. It does not "point," and is usually devoid of tenderness, pain, or heat upon manipulation. It is thus generally readily differentiated from class 3 without incision or aspiration.

In serous poll evil we not rarely find the bursa filled with small, flat, oval coagula of lymph, frequently about the size of flax seed, smooth, pale yellowish-white.

Abscess of the poll conforms to the general characters of abscess in other parts, subject to the influences of the anatomical conditions surrounding. Forming essentially on the median line beneath the cordiform ligament, the abscess tends to "point" or mature upon one or the other side of that structure—unilateral poll evil; or upon both sides—bilateral poll evil; or rarely it points centrally through the round ligament. In extremely rare instances—we have observed one—the pointing and rupture of the abscess occurs on the forehead, in the foretop, the pus escaping through the occipital crest upon the face of the patient.

The abscess cavity being examined, it is found to vary greatly in extent and form.[a] Generally, it is an ovoid sac, flattened from above to below through the influence of the compression between the neck ligament and bones. In many cases, the purulent cavity pushes its way upwards around the borders of the cordiform ligament, and then passes across above it, so that eventually a portion of the ligament may become more or less completely isolated in its circumference from the surrounding tissues, and become, instead, a naked cord passing through a pus sac. The pus may divide the ligament longitudinally into more or less separate bundles or laminæ. Portions of the ligament are usually necrotic, and in or about the necrotic areas calcareous deposits are probable. As the disease progresses, the pus may burrow outward and downward subcutaneously or intermuscularly. Usually the pus extends forward beneath the ligament till it is stopped by the occiput, and at the point immediately beneath the attachment of the neck ligament to the occiput is the most dependent portion of the pus cavity and the chief point of resistance in the handling of the disease. Here, at the anterior extremity of the pus sac, where it extends over the occipito-atloid articulation, the disease processes tend

to pass beyond the sac and invade the contiguous soft tissues, bones, and even the medullary meninges, ending in extensive ostitis and periostitis with erosions and exostoses of the occiput, atlas and axis, and resulting occasionally in more or less complete occipito-atloid ankylosis, with the resultant stiff neck, or, in very rare cases, it may so involve the medullary meninges as to cause sudden paralysis and death.

Our fourth class consists merely of our second or third class of cases which have been surgically opened, or, in the third, has spontaneously ruptured and a fistula resulted. They differ from the foregoing in but two particulars.

A fistula persists after the opening of the bursa or abscess, constituting a communication between the exterior and the sub-ligamentous sac. It may be very tortuous or comparatively direct. Not rarely, after penetrating the skin and subcutaneous tissues, there occurs an abrupt "fault," by which its course is deflected directly backward or forward, to the right or the left, in such a way that a probe can be caused to follow it only with difficulty or not at all. There are, in fact, two abscess sacs, an outer secondary one, and an inner sub-ligamentous primary sac, a condition which may lead to embarrassment and error in operating.

The second notable character of the poll evil with a fistulous opening is its vulnerability to bacterial invasion, and consequent septicæmia or pyæmia. We have little clinical evidence of fever during the poll evil of classes 2 and 3, though they exist occasionally in the swollen, tender lymphatics of the skin of the neck; but, once the bursa or abscess is opened, the portal for the entrance of various pathogenic organisms is open, and the possibility of serious or fatal septicæmia is always to be considered, especially following an operation. While the purulent or mucous cavity remains closed, cultures from the former are usually negative, while from the latter they are largely mono-organismal; but once opened the infection is mixed.

The bacteriology of poll evil and fistulous withers has not been extensively studied. In the serous poll evil or distended bursa mucosa, so far as we have learned, culture tests have uniformly proven negative. If an infection exists, it is at present unrecognizable. In closed abscesses, culture tests reveal generally streptococci. Once the abscess or bursa is open mixed infection occurs, and it takes on the biological features of infected open wounds. The character of poll evil affords opportunities for the growth of both aerobic and anaerobic organisms.

In some cases of poll evil and fistulous withers investigators have recognized the *Botryomyces equi*, and clinically numerous cases assume the botryomycotic type.

Fistulous withers is readily divisible into four classes, analogous in every respect to those we have above suggested for poll evil.

(1) Superficial fistulous withers, referable to a direct traumatism, with primary cutaneous lesions—false fistulous withers.

(2) Lymphoma of the withers.

(3) Abscess of the withers.

(4) Fistula of the withers resulting from class 2 or 3.

As in our corresponding class of poll evil, our class 1 of fistulous withers, originating from an evident external traumatism, is compara-

tively rare, there having been three cases among the 102 cases in our clinic, or 3 per cent., while in the 43 cases of poll evil none showed evidence of external injury. In these three cases the changes occurring were parallel to those mentioned in our class 1 of poll evil. Arising from contusions of the summit of the withers from harness, saddle, or other agent, there was necrosis of the skin over the summits of some of the dorsal spines, followed by progressive necrosis of the supra-spinous ligaments, necrosis of the spinous processes, and burrowing of pus downward along the spines toward the vertebral bodies. It may be uni- or bi-lateral, and its antero-posterior position may vary. This, like class 1 in poll evil, stands quite apart from the other three.

Classes 2, 3 and 4 have a common point of origin, the *fenestrum* in the ligament of the neck. While externally, as in poll evil, they may apparently be uni- or bi-lateral, they are really central. In the neck ligament, as shown at (*e*) in fig. 1, there occurs an oval foramen or fenestrum, 2 to 3 in. in diameter, which extends from side to side. It is located approximately opposite the space between the second and third dorsal spines, and is insinuated between the cordiform and lamellar portions of the ligament. For some unexplained reason most veterinary anatomists fail to note this foramen, though clinically the most important fact present. It has not, however, been wholly neglected, and Franck, more than half a century ago, drew attention in his work on anatomy to the important relation of it to fistulous withers. Chauveau and English anatomists ignore its existence. In an extended period of observation, however, we have uniformly found this foramen, and in fistulous withers have as uniformly observed, except in class 1, that the disease has its origin in it.

The cavity of this foramen is normally filled with loose areolar connective tissue, with perhaps other important histologic tissues, which, so far as we know, have not been studied. May not the secret of the importance of this foramen in fistulous withers, and of the subligamentous area at the poll in poll evil be explainable upon a histologic basis?

In Class 2, corresponding to the same class under poll evil, there occurs an accumulation of lymph or serum varying from the smallest recognizable amount to four or five litres, enclosed in a distended sac. The lymph is thin, transparent, and faintly yellow or reddish-yellow in colour, odourless, and gives negative culture tests. In some cases it contains varying quantities of small lymph coagula of the character already described in the corresponding class of poll evil. The distension appears opposite to the anterior border of the scapula, and the sac presses outwards beneath the trapezius muscle, either on one or both sides of the neck. Opened, the sac exhibits characters analogous to those described under Class 2 of poll evil, though the calcareous degeneration or deposits in the adjacent tissues is less frequent and pronounced. Undisturbed, it shows little tendency to suppurate, and occasionally disappears spontaneously in twelve to eighteen months. Opened, it tends strongly to become seriously infected, and, unless great care is taken, may lead to acute and fatal septicæmia. Otherwise it tends strongly to be followed by typical chronic fistulæ.

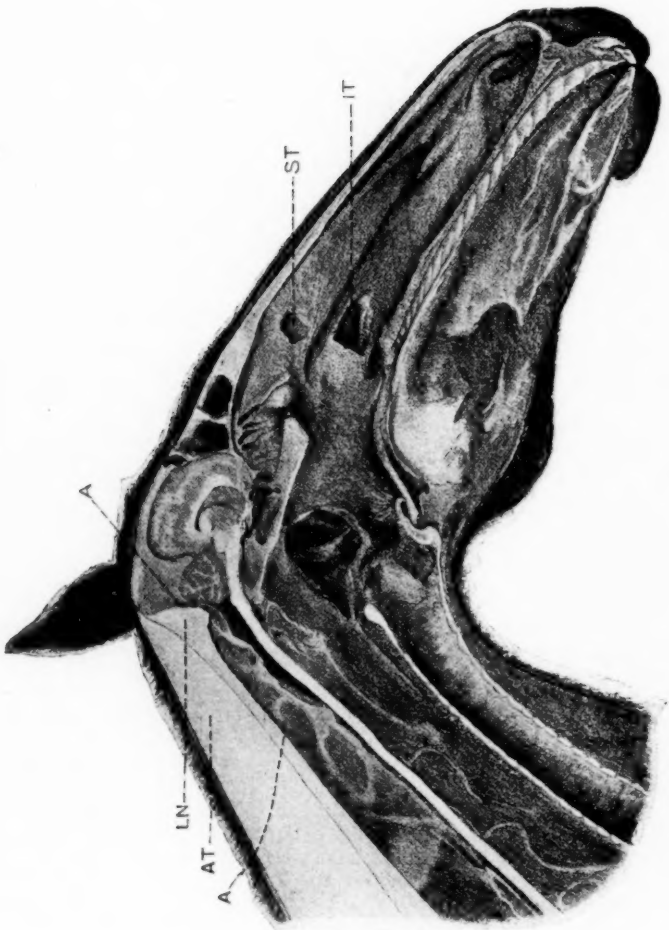
In Class 3, abscess of the withers, originating in the foramen on the median line, the pus burrows in a variety of directions. Usually

it burrows outward, uni- or bi-laterally, between the trapezius and rhomboideus muscles, and thence deflects backward between these along the cartilaginous scapula, tending to separate it externally from the trapezius, and far more frequently internally from the rhomboideus, so that the cartilage may eventually project free into the pus cavity, limited infero-externally by the insertion of the trapezius and infero-internally by the insertion of the rhomboideus. In an antero-posterior direction the purulent sac may exceed the width of the cartilaginous scapula, especially forward, and usually points and ruptures, if not surgically opened, in the vicinity of the anterior scapular angle, approximately opposite to the fenestrum in the ligament. If bi-lateral, there is now a passage through the foramen from side to side through which one to three fingers may be passed. The pointing and rupture of the abscess are not always typical. In some cases the pus escapes through the trapezius on the external surface of the scapula, and its deflection downwards is continued by the skin muscle and aponeurosis of the part, and the fluctuating abscess appears on the external surface of the scapula. Opened, more or less difficulty may be experienced in discovering the small, tortuous, fistulous connection passing up over the summit of the cartilaginous scapula to dip downwards and forwards to finally reach the fenestrum in the ligament.

In other instances, less common, the pus may burrow through the rhomboideus and gravitate downwards in the sub-scapular space to point and escape variously. Usually the rhomboideus is proof against the burrowing of the pus, and most cases of such occurrence are due to surgical error, by which the operator penetrates this muscle, and permits the pus to drop through this opening, after which further burrowing is quite unobstructed.

Rarely the pus burrows directly upwards from the fenestrum and points immediately on the median line. In this connection it needs to be recalled that the cordiform ligament consists of two lateral halves, with the point of fusion constituting the line of least resistance through which the pus may escape.

More frequently than upwards the pus burrows from the foramen directly downwards on the median line between the two plates of the lamellar portion of the ligament, and follows this obliquely downwards and forwards to ultimately reach the superior surface of the fifth or sixth cervical vertebra, where it tends to form an extensive sac, flattened from side to side and lying between the cervical portions of the two ileo-spinalis muscles below and the two splenius, angularis scapulæ and complexus muscles above. It never points in this region according to our observation, but the pus flows upwards into the foramen and thence escapes externally by any one of the exits above described. This condition is not rare, having been observed by us occasionally in private practice and four times (4 per cent.) in the 102 cases recorded in our clinic. The detection of the fistulous opening on the median line downwards from the fenestrum is frequently difficult, and in one case in our clinic we were baffled. The commencement of the downward fistula is small, sometimes very small, as narrow as $\frac{1}{8}$ in. or even less, so that it merely admits a large sound. It occurs on the median line, where it may be usually recognized by digital exploration, and the probe guided into it. In the one baffling case, while suspecting the condition owing to continued discharge from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an unrecognized source, we were unable to locate the small fistula leading downward from the foramen, except by *post-mortem* examination.

The pathological changes occurring within the pus sac and contiguous tissues present no fundamental differences from those of poll evil. There occurs not rarely, sometimes before, generally after the abscess is open, a more or less extensive necrosis of the dorsal spines. More frequently there is necrosis of the neck ligament, which, as in poll evil, is occasionally, though not so frequently, associated with calcareous degeneration. Necrosis of the cartilaginous scapula is not rare, originating ordinarily along the superior margin, and extending downwards towards the osseous scapula. Along the margin of the necrotic portion there are sometimes thrown out excessive granulations in the form of much elongated tufts, which may exceed an inch in length and give the parts a coarse velvety appearance. Ossification of the cartilaginous scapula is not uncommon. The ossification is more or less irregular, and results in a very marked thickening of the cartilaginous portion, increasing its diameter to $\frac{1}{2}$ or $\frac{3}{4}$ in., or even more.

In our fourth class, as in the corresponding fourth group of poll evil, the differences in pathological changes from groups 2 and 3 are dependent upon the opening, whether pathological or surgical, affording a portal of entry for various infections with tendencies toward serious or fatal septicæmia, increased necrosis of the tissues, and the burrowing of pus in a less regular manner.

Causes.

In Class 1 of both poll evil and fistulous withers the cause is undeniably traumatic. There are indisputable clinical evidences of a wound and historic data of its occurrence. On the withers it is largely due to an ill-fitting saddle, on the poll to an ill-fitting halter or to halter-pulling.

Groups 2, 3 and 4 are regularly attributed by writers on veterinary surgery to traumatic injuries, but the evidence is largely opposed to such contention.

It is no longer regarded that local injury is essential to the formation of abscesses, internal or external. In strangles, tuberculosis, actinomycosis, botryomycosis, pyæmic, and numerous other abscesses, it is freely admitted that the portal of infection may be remote from the abscess itself, and there is no evident reason why the same may not be true of poll evil and fistulous withers.

In our 145 cases there was a reliable history of traumatism in no case of poll evil, and in but three cases of fistulous withers, or a total of 2 per cent. of the cases presented, and these we have placed by themselves as Class 1.

The last three groups originate with great uniformity in the subligamentous area of the poll and in the foramen in the neck ligament at the withers; a traumatism should not uniformly expend its violence upon this one area to the exclusion of others. In fact, this area should possess the greatest possible degree of immunity to traumatisms as compared with the skin, subcutem, dorsal spines, and dorsal and cervical ligaments. These two areas of origin are protected admirably by the superposed elastic ligament. It is true that the tension of the

ligament over the poll is great, and certainly increases the gravity of existing poll evil; but the same conditions exist in a degree in other quadrupeds, in some being even more marked than in the horse, as, for example, in the elk and moose, owing to the great weight of the antlers, yet, so far as we know, the disease is confined to the horse. We stated above that we had observed one instance of fistulous withers in the cow, but this fell in our Class 1. Presumably it occurs in the mule and ass, though we have not known an instance, regardless of the fact that our observations among these have been considerable.

The malady is rural rather than urban. Were traumatisms the cause, the reverse should be true. Country horses are more gently handled, are not so frequently struck over the poll or withers, and less frequently become cast. Those believing in traumatism as a sole cause invoke low stables as an important factor, but we have no evidence that country stables are worse in this respect than those seen in cities. But the evidence of the occurrence of the malady in low stables is not good, and cannot be invoked as a cause in the vast majority of instances. Some attribute the alleged traumatism to the animal rolling on stones, which, of course, the country horse at pasture could best do, but it is seen quite as often in stoneless as in stony countries. We have related above that in the area tributary to our clinic there is a "poll evil and fistulous withers" patch, and it happens that, while most of our area is very stony, this patch is comparatively level and stone-free, and the consequent agricultural prosperity assures on the whole better (higher) stables.

By many it is attributed to traumatisms from the harness, saddle, halter, or other elements including stable, incident to labour, but among country horses it is comparatively quite common in unworked, unbroken, and unstabled animals. It is not at all rare in two-year-olds which have not been broken, stabled, or haltered.

The disease of the poll and withers may co-exist or alternate. In one case in our clinic the animal was presented with poll evil showing scars from a prior attack of fistulous withers; the affection responded tardily, and when apparently well was followed by a recurrence of the fistulous withers. Constitutional treatment was followed by prompt and permanent recovery. In numerous other cases animals were presented with both diseases simultaneously, the abscesses in neither case having ruptured, there being no historic or clinical evidence of traumatic injury. In several cases we have handled the animal successfully for fistulous withers, only for it to be returned after weeks or months for poll evil, and *vice versa*. According to our records, among the 145 cases, 8 or 5·5 per cent. suffered from both maladies. The frequency of the simultaneous, successive, or alternating occurrence of the affection of the poll and withers is too great to be safely attributed to coincidence, but calls for a more acceptable explanation.

It is interesting to note also that trauma occurring upon the poll and withers does not tend strongly to induce fistulous conditions, and when neglected finally leads to such a state; never in our experience does it cause the typical disease of our Classes 2, 3 and 4, but an atypical condition, not tending to involve the sub-ligamentous or fenestral areas, and which we have consequently been led to designate as Class 1, or false poll evil and fistulous withers. In our clinic we

handled one horse for fracture of the occipital summit, due to a kick wound from in front, and involving extensive laceration of the neck ligament at its occipital insertion, but the injury healed promptly and permanently, just as would a wound of other parts. In another case of extensive injury to this part the healing was likewise uneventful. We have not known a traumatism of either region to develop into what we have designated Class 1 of poll evil or fistulous withers except from gross neglect, and have never known a definite trauma of either region, however neglected, to cause poll evil or fistulous withers of the types designated Classes 2, 3 and 4.

Identity of Poll Evil and Fistulous Withers.

Writers generally, whatever their view as to etiology, consider poll evil and fistulous withers as identical or analogous. In a general way, their pathology, symptoms, course and prognosis are alike. While the number of cases of fistulous withers and poll evil, as suggested by our statistics, is somewhat more than two of the former to one of the latter, we are inclined to the opinion that this ratio generally holds true. If we omit Class 1 from each, the anatomical location of the disease is quite analogous and constant.

Treatment.

Those cases of poll evil and fistulous withers falling within Class 1 are to be handled in conformity with the general rules for open, infected wounds, the removal by excision or otherwise of all necrotic tissues, and the providing of effective drainage and thorough disinfection. These rules apply alike in a general way, whether we are dealing with the poll or withers, and even the anatomical differences between the two regions are not important in the more superficial cases.

In our other three groups of cases, anatomical differences of an important character call for an essentially different application of the details of the same general line of treatment.

Poll evil of the second, third and fourth groups are best handled by the radical operation which we have introduced in our clinic. This operation is briefly as follows: The patient, after proper preparation, is secured in lateral recumbency, preferably upon the operating table, placed under complete chloroform anæsthesia, the halter or other headgear wholly removed, and the foretop and the mane over the diseased area clipped and shaved and disinfected. A longitudinal incision is then made on the median line, commencing 4 or 5 in. posterior to the diseased area and continued over the summit of the occiput through the foretop region to the face. This incision should extend deeply through the skin, the subcutaneous connective and adipose tissues to the neck ligament, which may either be divided longitudinally or the incision deflected to the right or left around the side of the ligament and extended antero-posteriorly from the occiput to the posterior limit of the diseased area. The ligament is then to be dissected away from the adjacent tissues, either entire or in halves, from the occiput as far back as the abscess or lymph sac extends or the ligament is diseased, at which point it is to be divided obliquely upward and backward and then excised in front at its insertion into the occipital protuberance. Any remnants of ligament, necrotic tissues, or calcareous deposits recognizable are to be removed. The

operation is greatly facilitated by the use of suitable wound retractors in the hands of an assistant. Abundant forceps should be at hand for compressing the rather numerous arteries encountered, and the blood should be kept cleared away.

We further provide for drainage over the face and the complete removal of the occipital attachment of the neck ligament. The first object, and a part of the second, is attained by cutting a longitudinal groove on the median line through the summit of the occiput. This may be readily done with Luer's bone forceps, or quite as well, perhaps, with a curved bone chisel, a groove about ¾ in. or more deep being made in the bone, the operator exercising his judgment in making it as deep as is wholly safe without wounding the cerebellar cavity. This removes most of the insertion of the ligament to the occiput; the remainder is to be removed by curetting, which may be accomplished by means of an ordinary curette, which must be quite heavy and strong, or better with the Luer's bone forceps, by resting one jaw upon the bone as a fulcrum, and then forcibly scraping the other jaw across the ligamentous insertion. The curetting may also be very conveniently done with an ordinary strong hoof-knife. The curetting is to be cautiously and thoroughly done. Every vestige of the neck ligament where it is inserted into the occiput is to be entirely removed, since this constitutes the chief point of resistance in the handling of the malady. The operator must here take heed lest he wound the capsule of the occipito-atloid articulation. There is no necessity for the error if the operator will keep the wound well retracted and cleared of blood, and locate definitely the insertion of the ligament, and, in curetting, not go beyond it.

Partially detached fragments of bone or soft tissues having been carefully removed from the entire wound area and the wound cleansed and disinfected, a strip of antiseptic gauze approximately of the same bulk as the excised tissues is to be inserted into the wound from end to end, and the cutaneous wound closed by means of a strong continuous suture. The skin of the mane being very thick and dense, the needle for carrying the suture needs to be heavy and sharp. The gauze may be allowed to protrude slightly at the anterior end of the wound, and, on the following day, should be withdrawn and the wound thoroughly disinfected. The sutures may be removed the second or third day and the wound left open, being regularly disinfected. In dressing the open wound, after irrigating with 1-1,000 sublimate solution or other reliable disinfectant, we recommend a slight covering with iodine, to accomplish which we drop tincture of iodine on the dried wound from a dropper or small bottle until its surface is well covered. After a few days, when the suppuration declines, irrigation or washing is discontinued, the small amount of pus is wiped away with cotton, and tincture of iodine carefully dropped over the surface. For some days the wound gapes widely, but granulation is quickly established, and contraction begins and proceeds rapidly until the cutaneous margins of the wound come in contact, the mane and foretop grow, and no visible scar remains. We prefer this operation to others described because it is more positive in its results, and offers an opportunity for the complete eradication of the diseased parts at once; because granulation is quickly established in every part of the wound, and recovery follows with great promptness; and largely

because the recovery is complete and permanent, and leaves no visible scar.

Other plans of operating have been recommended by various writers. Mere transverse severing of the neck ligament at the poll frequently suffices, especially in those cases where there is merely a sub-ligamentous suppurating sac without marked disease of the ligament itself. In this case the operation exerts its influence through relieving the sub-ligamentous tissues from the compression and friction of the tensely-stretched ligament. Severing and excision of the diseased portion of the neck ligament has been practised and recommended for half a century, and frequently gives good results, but, with us, has not been nearly so successful as the foregoing. It necessitates a transverse incision for drainage, with a resultant scar, and even then the wound cannot be so completely drained without serious mutilation. In our operation the drainage is so complete when the animal is permitted to eat from the floor, or to otherwise lower its head, that it is well-nigh perfect and obviates the collection of any wound discharges, so that, in a typical case, convalescence, or the advent of normal granulations over the entire wound surface, occurs in six to ten days, and extensive suppuration ceases. Finally, the incision confined to the median line, and including the groove through the occiput, is the only method by which visible operative scars are regularly avoided.

Some cases of poll evil respond to the injection of antiseptics and escharotics into the suppurating cavity, some recover under severe blisters to the poll, and some will recover spontaneously, but by these means the recovery is tedious and exceedingly uncertain. We have laboured with antiseptic and escharotic injections for months or even more than a year, in fact until the owner became disgusted, without making material progress, although the cases were very mild in character and the ligament apparently free from disease.

The handling of fistulous withers offers greater complications and difficulties. Our first class, originating from an evident wound or contusion, offers little for remark beyond provision for ample drainage, the exposure of all diseased parts by free incision, so that free aeration may eliminate anaerobic infection, afford opportunity for controlling aerobic infection, and expose the diseased tissues to view in a manner to readily permit the detection and removal of necrotic portions or others which are badly involved. The free opening, combined with thorough antisepsis, constitutes the general indications for treatment, the details of which must be adjusted for each individual case.

Our second group of cases, lymphoma of the withers, constitutes the most dangerous class from the standpoint of septicæmia following surgical interference. As stated above, even when very large, the exudate may be absorbed after a delay of twelve to eighteen months, but such result, in our observation, is rare, and so improbable that it is a negligible element in its handling.

The application of blisters to the region is of scant value, at least we have been unable to observe any influence from vesication or the external use of astringents or other remedies.

We have resorted to repeated aspiration of the lymph and the injection of tincture of iodine into the cavity, but always in vain, and have uniformly been forced to open the lymph sac or bursa freely. But we cannot incise these with the same freedom and assurance with

which we open a lymphoma of the shoulder, stifle region or elsewhere, where they are regularly and clearly due to a known contusion. There are few conditions or structures with which the surgeon is called to deal where the danger from fatal septicæmia is more imminent. We would rather invade the peritoneal cavity than a lymphoma of the withers. The operation needs be undertaken under the strictest possible precautions against infection. It is best to shave the region, and apply an antiseptic pack to the part twenty-four hours prior to operating, and plan the procedure carefully in every detail as to antisepsis. With the animal properly prepared and anæsthetized, free incisions are to be made in such a manner as to insure the best possible drainage. Usually the incision should be transverse to the long axis of the neck, beginning above approximately opposite to or slightly in front of the fenestrum in the neck ligament and carried directly downwards for a distance of 4 or 5 in., including the skin, skin muscle and trapezius, with such other structures as conditions may dictate, the incision passing just in front of the supero-anterior angle of the cartilaginous scapula. Wounding of the scapular cartilage is to be scrupulously avoided, and it is desirable to slant the incision obliquely from before backwards, the skin incision being thus anterior to that of the trapezius muscle. If the distension is bilateral, the incision needs to be bilateral, and even when the distension is unilateral a bilateral incision is usually advisable, since a perforating opening from side to side through the foramen of the ligament affords the best plan for dressing and drainage.

In confining for the operation the position of the patient should be nearly the normal as possible. Many prefer to operate on the standing animal, and for very good reasons, because it is difficult to confine in recumbency without distortion of the withers, so that an incision made presumably at a given point and in a certain direction on the withers of a recumbent animal proves quite otherwise when the animal regains its feet. This displacement is largely dependent upon the degree of forced flexion or extension of the anterior limbs. Confined upon the operating-table with all limbs secured extended perpendicular to the long axis of the body, the objection is obviated, and consequently the table offers by all means the *best* method for confining the patient in recumbency. Next to it are the English hobbles without the back rope, and worst of all are those methods which secure the patient by flexing all feet beneath the body. These considerations apply alike to confinement for operation in all three classes of typical fistulous withers.

After the incisions have been satisfactorily completed, the lymph cavity should be carefully packed with antiseptic gauze and the skin wound accurately closed, disinfected exteriorly, and the disinfection repeated frequently during the first twenty-four hours, which constitutes the period of greatest danger from infection. At the close of twenty-four hours the antiseptic gauze should be removed, and either renewed or replaced by open handling, though, in our judgment, it is better and safer to keep the wound closed for two to three days, the dressing being renewed daily, and the region irrigated thoroughly with antiseptics several times daily. The choice of disinfectants to be employed is possibly not important, but we greatly prefer tincture of iodine for saturating the gauze to be inserted into the lymph sac

or bursa. Externally, aqueous carbolic acid or corrosive sublimate solution is good. The danger from acute septicæmia is well passed in three days, when it is best to treat as an open wound, still adhering, in our jndgment, to the tincture of iodine as the most effective antiseptic to be applied in the wound; but it is doubtless less important *what* disinfectant is used than *how* it is applied. The animal should be fed from a high manger, and all necessity for reaching the ground or floor for food or drink shonld be obviated in order to avoid tension and dragging upon the ligament, muscles, and other structures in or about the affected area.

The general health should be guarded by proper diet and care.

In Class 3, the withers abscess should be opened as early as the presence of pus may be detected. The preparation and confinement for the operation should be as in Class 2, while the incisions are to vary according to conditions. Usually the basic incision is to be made at the same point and approximately in the same general direction as advised under Class 2, with such other secondary incisions as conditions may dictate. The operator must bear in mind that the chief or central objective point is the fenestrum of the ligament, and that ultimately this is to be reached. As already related, the abscess may variously point, and naturally a tentative, preliminary, or exploratory and evacuant incision may be made at the point of greatest fluctuation, but this does not modify the eventual desirability or necessity for the incision planned to reach the foramen in the ligament. As in Class 2, so in 3, the incision may be uni- or bi-lateral according to conditions. In considering the pathological anatomy we noted the fact that sometimes the visible abscess is on the external surface of the scapula, and that this connects by a tortuous and sometimes well-nigh unrecognizable narrow canal with the foramen of the ligament, at which point a small suppurating cavity exists, which must be reached. Hence the rule that in handling abscesses of the region of the withers, but not typically located, after they have been incised and their contents presumably evacuated, a minute search should be made of every part of the abscess wall for a hidden channel leading to the typical seat of the malady.

In addition to this basic incision, others are to be made in such number, situation, direction and extent as to ensure proper drainage for each and every part, destroy or limit to a minimum anaerobic infection by the free admission of air to every part, remove or limit as far as possible harmful tension, friction or pressure upon the tissues involved, afford convenient approach to every part for the examination and removal of any necrotic or other undesirable tissues, and give the best possible facility for convenient and effective dressing.

Care needs to be exercised in the division of muscles in order to avoid so far as possible inter-muscular infection and serious blemishes due to deformation from transverse division. A dangerous area from the standpoint of infection is the region of the postero-superior angle of the cartilaginous scapula; here the muscular layers are so free from each other and separated by so much very loose areolar connective tissue, and the movements of the scapula and its attached muscles are so constant and extensive that gravitation infection through the newly-made wound is extremely difficult to avoid, the purulent infection, once in the loose areolar tissue, extending

downwards and backwards beneath the trapezius, skin, or other muscles to almost any degree. In one such case in our private practice the infection extended backwards along the longissimus dorsi muscles on both sides from the withers over the back and loins to the sacro-iliac region, forming a vast suppurating cavity from which pus could be forced by pressure upon the loins out through the incision at the withers. Incisions through the muscles at this point should be studiously avoided so long as possible, and it is very rarely necessary, and when unavoidable should be undertaken with the greatest possible care. Even when serious inter-muscular infection is avoided incisions at this point heal badly, because of the persistent movements of the parts. Inter-muscular infection and suppuration also follows at times incisions at the antero-superior angle of the scapula, but it is neither so frequent nor severe, and is usually readily controlled by shallow incisions through the skin and skin muscle lower down on the side of the neck after the secondary suppuration has become established. Here, too, difficulty is sometimes experienced in securing union of the cutaneous wound should it be badly directed. In one case in our clinic the fistulous withers responded well, and the cure was permanent; but there remained a very annoying ulcer extending merely through the skin and not more than 1 in. in diameter, which baffled every effort to bring about healing, owing to the persistent motion in the part. While it did not interfere in the least with the ability of the animal to perform ordinary farm work, it was very annoying to the owner, and diminished greatly the market value of the animal.

The trapezius muscle must frequently be incised in such direction and to such extent as conditions indicate. A single perpendicular incision through it in front of the scapular angle heals well. We have suggested that the pus sac frequently lies between the trapezius and rhomboideus muscles, extending in an antero-posterior direction for nearly or entirely the width of the scapula, extending downwards behind the cartilaginous scapula to the insertion of the rhomboideus or externally to the insertion of the trapezius, or extending both behind and externally to the cartilage; this causes the cartilage to project naked into the pus sac, so that the latter might be likened somewhat to saddle-bags suspended from the superior border of the cartilage, and hanging down on either side of it. Drainage for these sacs may be provided by incisions parallel to the anterior scapular border and slightly below the antero-superior angle, the basic incision we have suggested for reaching the fenestrum serving the double purpose after making slight changes in its deeper parts to freely connect the sacs with it. But this drainage does not always suffice: in one instance in our clinic where the sac involved both the external and internal surfaces of the cartilage of the scapula, the walls of the sac obstinately refused to heal under any plan of drainage or medication owing to the persistent scapular movements. Finally, in sheer desperation, the skin, skin muscle, and trapezius were divided antero-posteriorly for the entire width of the scapula directly over and parallel to the superior border of its cartilage. The resulting wound gaped enormously, and at first impressed one as anything but judicious. Freed from the restraint of the trapezius, the scapula at once pushed upwards and outwards, the incision had obliterated the extra-scapular sac, the change in the position of the scapula obliterated the sub-scapular pus

sac, and every part was exposed freely to air and light, and all tension and friction of the parts had been removed. The diseased surface granulated promptly, rapidly and effectively, the suppuration was at once reduced to an unimportant amount, the wound rapidly retracted, the healing was rapid and complete, and the scar unimportant.

The rhomboideus muscle, next to the trapezius, is probably the most frequently involved in the surgery of fistulous withers. Posterior to the anterior angle of the cartilaginous scapula, perforating wounds of this muscle should be scrupulously avoided, unless some unusual condition absolutely demands them, because the integrity of this muscle constitutes the chief barrier against the gravitation of purulent infection downwards in the loose areolar tissue of the sub-scapular region. Anterior to the scapular border, the danger from purulent infiltration after wounding or severing the rhomboideus is neither great nor serious, but the objection remains that if completely severed the anterior portion retracts and bellies out, leaving a corresponding depression at the seat of the incision, and causing an objectionable and ineffaceable scar. Satisfactory drainage having been provided for the usual abscess cavities, a thorough examination is to be made for necrotic or other seriously involved tissues.

If the cartilage of the scapula is found diseased, proper measures are to be taken to overcome it. Great care should be constantly exercised in operating to avoid wounding this cartilage, as it is one of the most obstinate tissues to heal in the animal body. The most common disease of the structure is necrosis of its superior margin. The necrotic portion is to be removed, and in doing so the operator faces the serious difficulty that, no matter how careful, it is next to impossible to avoid a recurrence of the necrosis in the freshly-exposed incised surface. If the freshly-cut surface is to heal at all, the drainage must be perfect, and contact of wound discharges with it is to be jealously prohibited. In excising the necrotic cartilage, the surgeon should see that his scalpel is perfectly sharp and the excision made as clean as possible, taking care that the perichondrium, from which the healing must occur, is not torn away from the cartilage or frayed by a ragged cut. When necrosis of this cartilage is present, it is an important question if the entire structure should not be at once sacrificed in the interest of a prompt recovery, instead of following the more conservative plan of excising only the necrotic portion and taking the risk of having to repeat the operation time and again, until eventually the same result is reached. Fortunately, while operating conservatively, one often encounters an ossification of the cartilaginous scapula, and when this occurs the necrosis becomes arrested, and healing follows. In some cases the margin of the cartilage is necrotic, while its body is ossified and greatly thickened, in which instance the necrotic portion is to be removed and the ossification ignored. Ordinarily there is no warrant for surgical interference with ossification of the cartilage, but in our experience it is rather to be welcomed as an avenue of escape from a very annoying condition.

Necrosis of the dorsal spines may have progressed far before the abscess is opened; sometimes they are denuded, coarsely porous, fragile, and even at times spontaneously fractured. This latter condition may lead to an error in interpretation, the surgeon attributing the fistulous withers to the fracture, instead of the fracture to the fistulous withers.

In other cases the summits of the dorsal spines are greatly enlarged as the result of ostitis or periostitis. Necrosis of the dorsal spines is to be handled vigorously and yet conservatively. The necrotic portions are to be promptly removed, and, as in the case of the necrotic cartilage, healing need not be regarded as assured, or even probable, unless the denuded surface is kept free from wound discharges by thorough drainage. Unnecessary removal of the spinous processes is to be condemned, since any considerable removal inevitably leads to a very unsightly dropping of the withers; but if the necrosis is there, it must be removed, notwithstanding the blemish. The surgeon must also be careful, in the removal of necrotic portions of vertebral spines, lest he invite a continuance of the process by denuding the healthy bone of its periosteum in the process of curetting or excision. Curetting in the ordinary manner tends constantly to tear away the periosteum from the sides of the spines. It is better here to do the work as far as possible with keen-cutting bone forceps, and limit the use of the curette to the minimum, or exclude it, if possible.

Necrosis of the interspinous ligaments is occasionally troublesome; the dead tissues cannot usually be removed surgically, and their oughing away under antiseptics must be awaited.

Necrosis of the neck ligament is common, and its handling very trying. It cannot be wholly severed here without serious results. If we apply caustics or actual cautery to the necrotic portions, in many cases the necrosis extends to the adjacent portions before sequestration occurs, and our aim is frustrated. If we excise the necrotic portion, the denuded surface again tends to necrose. In our experience, liberal excision of the necrotic portions, including a layer of adjacent healthy ligament, is the best procedure, and, this accomplished, vigorous disinfection, characterized rather by volume and frequent repetition than strength, is to be applied to prevent extension of the process. The application of cautery or caustics, or powerful antiseptics, to the denuded ligamentous surface is to be excluded as tending to invite further necrosis.

Calcareous degeneration of the neck ligament at the withers has proven especially obstinate in our clinic, though, fortunately, not common. Of course, if the excision of all such degenerated ligament is feasible, well and good, but in one case especially we essayed to excise, so far as we could recognize, all the diseased portions, yet the surface refused to heal, calcareous nodules were again recognized beyond, excision again applied, and again and again in apparently endless rotation of excision, followed by further necrosis and the detection of other calcareous masses further along in the ligament.

One condition in relation to the pus cavity deserves special mention: the gravitation of the pus downwards and forwards from the fenestrum, along the first rays of the fan-shaped portion of the neck ligament toward the sixth or fifth cervical vertebra, to form above the cervical vertebræ an extensive pus sac flattened from side to side. In opening an abscess of the withers, or in handling a fistula of this region, the floor of the fenestrum should be cautiously searched for such a channel beginning on the median line by an opening not always readily perceptible. The existence of such a condition may be suspected from the presence of an indefinite thickening of the neck in this region; it does not point or fluctuate, nor does the swelling stand out boldly.

It may be suspected by a discharge of pus which is not readily attributable to the usual suppurating cavity of the region. Perhaps the identified portion of the abscess cavity has been irrigated and apparently thoroughly cleansed, and a few minutes later a change in position or sudden movement of the patient is followed by a flow of pus. Such conditions point strongly to this form of abscess. In the 102 cases in our clinic, this condition has been observed four times, or in 4 per cent., which corresponds approximately with our prior observations in private practice.

When this condition is recognized, a long, rigid sound, preferably slightly curved at its distal end, should be introduced into the channel, usually 10 to 14 in. deep, and the pus cavity opened at the bottom. The sound for this purpose should be about $\frac{3}{32}$ in. in diameter, and quite rigid, so that its location may be determined by measurement and by touch. The cavity being accurately located, a perpendicular incision is to be made into it from the side of the neck, the side chosen being quite immaterial, as the cavity is on the median line. The incision should be 5 in. or 6 in. long, and pass through the skin, splenius, angularis scapula, complexus, and, usually, the cervical portion of the ileo-spinalis or great dorsal muscles. Along the superior border of the latter, the operator usually severs the main trunk of the cervical artery, which bleeds profusely, if, indeed, not alarmingly to the inexperienced. The hæmorrhage must be promptly controlled. Usually, the operator, guided by the powerful blood-stream, can recognize and grasp the cut end of the vessel with his fingers, and then apply compression artery forceps, which may be left in place for twenty-four hours. This failing, he can promptly control the hæmorrhage by firmly packing the wound. The vessel is not ordinarily severed until the pus cavity is penetrated, and, rapidly passing the fingers into the cavity, one or two vigorous strokes with the scalpel may finish the incision and insure drainage, and the entire attention then turned to the hæmostasis, and the artery either caught and compressed by means of forceps, or the wound tightly packed with antiseptic gauze.

If the vessel is secured, the tract should be well irrigated and a double strip of cloth or tape inserted from above to below, the cut ends protruding from above, the closed end from the new-made incision. In this closed loop, a pack of antiseptic gauze, large enough to completely and tightly fill the wound, is to be introduced, the loose ends above drawn upon vigorously, and the pack tightly forced into the deepest parts of the wound. A second piece of antiseptic gauze is to be laid over the upper wound between the free ends of the tape, and these then drawn firmly and securely tied over it, so that there is a firm antiseptic tampon in or over each opening, securely held in place by a stout double tape. This insures against hæmorrhage, whether the artery has been secured or not; it pushes the severed muscles apart, and insures a free opening later. Twenty-four hours later, any danger from hæmorrhage from the divided vessel has passed, the pack is to be removed, the wound irrigated from above, and left open. The severing of the entire thickness of the neck muscles on the one side for 5 or 6 in. renders the patient very stiff for three to five days, and it should be carefully fed and watered from a convenient height. In a few days, however, the soreness abates, and, in our experience, this type of case makes the most rapid and successful

recovery of any, our only misfortune having been with one case in which we failed to recognize the fistula and destroyed the animal as incurable, though shown by *post-mortem* examination to have been readily amenable to handling.

In Class 4 the method of handling differs in no essential particular from that just described, but more extensive necrosis and burrowing of pus are liable to be encountered.

Other methods of handling fistulous withers have been tried and commended, their general design corresponding to those already related in poll evil. Some cases, even after opening and discharging for months or years, recover spontaneously, which furnishes a basis for some of the tales of results from pouring substances in the patient's ears, or by means of other legerdemain. Some cases recover following the application of a severe blister, but there is little reliance to be placed in this form of handling.

What the pathological conditions have been in cases of fistulous withers (or poll evil) where spontaneous recovery, or recovery under a blister has occurred, we do not know. Probably there has been little or no necrosis of the neck ligament or of the bone.

In better repute is the handling of fistulous withers by means of caustics and escharotics. For this purpose, all drugs capable of inducing cauterization have been used and commended. Among these may be mentioned the concentrated mineral acids, the caustic alkalies, the sulphates and chlorides of the heavy metals, carbolic acid, arsenious acid, and a long line of others. Good results have been recorded from these. Probably sulphate of copper, introduced into the depths of the pus sacs in the crystal state, is in as high repute as any substance, and has been used for this purpose for a century. Powdered arsenious acid and powdered corrosive sublimate, introduced in the same manner, have their advocates. They are introduced deeply into the pus sacs and allowed to remain undisturbed, causing a more or less extensive sloughing of the walls, the sequestrated portions finally being thown out and typically leaving behind a vigorously granulating surface. With carbolic acid, one plan is to take the crystalized acid and add sufficient water, alcohol, or glycerine to render it liquid. Protecting the surrounding tissues from injury by means of a coating of vaseline, the acid is forced into the sacs till filled, retained there for a few minutes, and then washed out with alcohol, and the treatment repeated after one or two weeks.

Systemic medication constitutes an important adjunct in the handling of poll evil and fistulous withers, and, in some cases, may readily be granted priority. In fact, some cases which refuse utterly to yield to local measures respond promptly and effectively to internal medication. As in other forms of wound infection, so in this malady, when acute sepsis follows an operation, internal medication has an important place. In our hands, when acute wound fever occurs after operating, we resort to large doses of potassium iodide or quinine, one or even two ounces daily being given. Others resort to calcium sulphide and other remedies, while still others use antistreptococcic or other sera. Collargolum and other silver preparations intravenously have been highly recommended by some.

When an animal affected with fistulous withers or poll evil is evidently in an enfeebled condition, it is essential to restore, as far as

possible, the normal general health before good results from handling the local lesions may be hoped for. Tonics and alteratives here serve a highly important purpose, and such drugs as the sulphates of iron and copper, potassium iodide, arsenious acid, &c., may be used with advantage. The most marked results, however, from internal medication occur in those cases, by no means rare, where the disease assumes the type of botryomycosis. The withers or poll, or both, are much enlarged, indurated, and show multiple small abscesses, which heal when opened, only to be followed by others after a brief interval. In other cases we cure fistulous withers and poll evil follows; cure that, and the disease of the withers recurs; but handle the disease by a vigorous and continued course of potassium iodide and the disease permanently vanishes, and the local induration disappears. We have used potassium iodide much in tedious, resistant cases, and with highly satisfactory results, as an adjunct to our local handling, even though the case shows no clinical evidence of botryomycosis. Cases which have been tedious or at a standstill for weeks begin to respond soon after iodine medication.

It is because of this apparently specific action of iodine internally that we have been induced to give the first place to the tincture of iodine as a local dressing, and this we largely use after the first few days succeeding an operation.

Prognosis.

As intimated at the outset, the prognosis of fistulous withers and poll evil is not good. The mortality, which is not light, is not the worst feature prognostically, but is exceeded by the slow, tedious, uncertain recovery, the cost of handling, the loss of service, the depreciated value of the recovered animal, and the tendency to recur.

In our clinics the records of fistulous withers show that of the 102 cases presented and recorded, there were handled eighty-seven cases, of which sixty-five cases, or 75 per cent., were cured; there died from operation or were killed, as physically or economically incurable, ten cases, or 11 per cent; while twelve cases, or 14 per cent., were improved or cured, and later recurred.

Of our forty-three poll evil cases, twenty-eight, or 72 per cent., were cured; five, or 13 per cent., died or were destroyed as physically or economically incurable.

In the statistics of the Berlin clinic, of the eleven cases of poll evil handled, eight, or 54 per cent., were cured; three, or 27 per cent., died or were destroyed; and two, or 19 per cent., were improved.

In the same clinic, the record of twenty-three cases of fistulous withers handled indicated seventeen, or 74 per cent., of recoveries; five, or 22 per cent., died or were killed; and one, or 4 per cent., improved.

The causes of death in our cases were divided about equally between septicæmia and chloroform pneumonia, with one fatality in poll evil from erroneous opening of the occipito-atloid articulation by an inexperienced operator, the animal succumbing from myelitis, with paralysis, five or six days after the wound. The chloroform pneumonia has latterly been largely eliminated by improved technic in anæsthesia, while advances have also been made in the prevention of septicæmia.

Many veterinarians, especially in America, oppose chloroform anæsthesia in these operations, but, in our experience, it is highly advantageous. The danger from chloroform syncope, or, later, from the chloroform pneumonia, does not exceed the dangers from confinement without anæsthesia, if we consider under the latter the increased danger from hæmorrhage and sepsis. The danger to the operator is lessened. The after treatment is greatly facilitated in time and efficiency. An animal operated upon under anæsthesia stands for dressing without wincing, will usually stand with the halter and without a twitch, and after recovery shows no shyness about the poll or withers. Operating without anæsthesia, the horse is very resistant to dressing, requires much time for confinement, and his resistance prevents proper dressing. Under anæsthesia the operator can proceed more deliberately and carefully, and take better precautions against sepsis. The humane question of animal suffering is wholly in favour of anæsthesia.

THE VETERINARIAN IN THE MALAY STATES.

BY ELTON BELL, M.R.C.V.S., MUNICIPAL VETERINARY SURGEON, PENANG.

One is often asked regarding the prospects of a veterinary surgeon in the East, and it is a somewhat difficult question to answer, as the modes of life are so very different. The East is the East, and the West the West, but I will try briefly to give some idea of the kind of life and the conditions under which one has to work. I must speak for the Straits Settlements only, as my knowledge of India is very superficial. I know the Malay Peninsula fairly well, my residence there having extended over thirteen years.

I will take first of all the climate and general life. The climate is fairly healthy for a tropical place, the temperature rarely varies between about 75° to 90° F. It is the want of seasons, cold and hot, or wet and dry, which makes it trying perhaps to some individual constitutions. I speak of the low-lying land where one has to live, and not such places as Tarping or Penang hills, where there are sanatoria.

If married one has to consider European women. In many cases women stand the climate badly, and may perhaps have to spend one year in every three in Europe or some temperate climate. Again, children have to be considered, and just about the age when they are getting interesting they have to be sent home, both for educational purposes and for their health's sake. So that, taking it all round, married life may not give nearly so many comforts as one has a right to expect in England, and often one has to keep two homes going, which is of course very expensive.

So much for climate itself. With regard to social life, it is, I think, good, the clubs, social and athletic, are excellent. One can indulge in golf, tennis, cricket, &c., to one's heart's content. There is plenty of sport in the way of shooting, &c.

All the veterinary surgeons in the Malay Peninsula, with one

exception, hold either Government or municipal appointments; there is one veterinary surgeon in Singapore who is connected with a large dealing and livery business. I know of no town in Malaya which could give a decent living to a veterinary surgeon engaged in private practice only. Government and municipal appointments offer, I think, a fair opening to the young veterinary surgeon who is unmarried, as salaries range from about £300 to £700 or £800, and if a man is keen on his own professional work his field is unlimited. With regard to this I should remark that, particularly in respect to municipal work, it is very cosmopolitan, and has to do with regard to native customs and prejudices far more than the Government. I will mention as an illustration of what I mean that in the abattoirs in Penang the municipal veterinary surgeon, who is superintendent, will have to manage 1,200 to 1,500 rough class Chinese on certain nights in the year. He is the only European official present, and has only his native staff for help.

One other thing which should be considered by a young veterinary surgeon who contemplates going in for this class of work is that in the majority of cases it totally unfits a man for English private practice; consequently, if his health should break down and he be forced to return to Europe he may find it difficult to pick up the thread of European ways again. The cost of living is rather higher than in England. Government offices are pensionable, municipal are not, but have a very liberal provident fund. The pay of municipal officials is higher than that of those under the Government.

I attach an abstract from the returns and report for 1907, which will, I daresay, give a better idea of the work done than anything I can say:—

The staff of the municipal veterinary department Penang is made up as follows: One veterinary surgeon in charge, one (Madras qualified) veterinary inspector, five sub-inspectors (unqualified), two cashiers (Chinese), three clerks (Chinese), eighteen veterinary police (Malays), four syces (two Malays, two Klings), twenty-eight Chinese slaughterers and dressers, eight Malay slaughterers and dressers, eight Kling slaughterers and dressers, fourteen coolies.

The general working of this department has been satisfactory. There has been a considerable increase in the work of all the sub-departments.

Abattoirs.—Work has gone on smoothly. There has been an increase of about 8,000 in the number of animals brought for slaughter over 1906.

The principal increase is in swine. The class of pig brought is, however, of a somewhat inferior quality. This I consider is partly due to the large number of cases of swine fever, and partly to the fact the butchers now buy from dealers and brokers on the condition that they pay only if the carcase passes the abattoirs. The greater number of entire carcases condemned are on account of swine fever.

I would again this year emphasize the need there is for establishing properly conducted markets for sale of meat and closing the present shops, which are altogether unsuited for the purpose. Also all hawkers should be licensed. If this were done a thoroughly reliable protection would be given to the public.

Pig Market.—There has been a large increase in the number of pigs dealt with, nearly 16,000 over 1906.

Infirmary for Animals.—This institution has done good work. There were 1,224 cases treated as against 748 in 1906. A small laboratory has been started for work in connection with the infirmary and abattoirs. The fittings are, however, as yet incomplete. A rabbit breeding run will be put up in connection with it.

There was one case of foot-and-mouth disease in a bullock which was under treatment as an in-patient with a sore neck. Measures were at once taken to prevent the spread of the disease, and no other animals were affected.

During the latter part of the year a very severe type of distemper broke out on the island amongst dogs. There were a large number of cases, nearly all of which proved fatal. Early in November a case of canine rabies was detected; in all six cases occurred. As soon as the diagnosis of the first case was verified prompt measures were taken. A chaining order was applied for and put in force, and two extra sub-inspectors engaged; 304 dogs were destroyed in November and 157 in December.

Two Chinese, a man and a woman, got two weeks imprisonment without the option of a fine for plucking pigeons while alive. Dog shooting was carried on regularly throughout the year. It would be better for many obvious reasons if the registration of dogs was done by the Veterinary Department. The total number of dogs shot during the year 1907 was 753, and the number of cats shot during the year 1907, 465. There were twenty-eight horses destroyed.

Mr. J. M. Wesley, who was appointed Municipal Veterinary Inspector, arrived on April 18 and took up his duties.

Clinical Articles.

SARCOMA OF THE HIND LEG OF A DOG. AMPUTATION.

BY G. H. WOOLDRIDGE, F.R.C.V.S., PROFESSOR IN THE ROYAL VETERINARY COLLEGE, LONDON, N.W.

THE subject was an aged favourite dachshund male dog. He was so extremely thin and emaciated that he only weighed 10 lb. when he was brought under my observation by a good country practitioner. The history of the case was to the effect that a tumour had made its appearance some month or two previously in front of the left metatarsus, and had been excised. For a while the wound appeared to do well, and then the growth recurred and grew fairly rapidly. The growth was again excised, with the same result. At the same time a swelling appeared behind the thigh. An attempt was made to keep down the earlier growth by the application of caustics, but without avail. The dog gradually got thinner and thinner, and his appetite was very capricious. The swelling at the back of the thigh, which had been a little painful, became hard and indurated, and less painful. This was the condition when he was brought to me, with the addition that

the metatarsal bones were exposed and becoming carious. From the general appearance and history of the case I suspected that the growth was a malignant sarcoma, with probable metastasis to the glands and internal organs, causing the great emaciation. I snipped off a portion of the new growth for diagnostic purposes, but could only find granulation tissue on microscopic examination.

The dog being a great pet, the owner wished any operation to be performed which might have the slightest chance of saving his favourite's life. So I decided to amputate the leg at the tibio-tarsal joint, and to excise the enlarged popliteal lymphatic glands. Accordingly injectio morphinæ B.P. ℥xx. (containing tartrate of morphia gr. i.) was injected under the skin of his back. He was put on the table nearly an hour later and chloroform was administered. He was very rapidly anæsthetized, and went under without the usual period of excitement. The operation was carried out with all possible speed, a good flap of skin being reserved in front and behind for suturing over the stump. The case did very well, and the wounds healed rapidly, the only difficulty being experienced in retaining dressings and bandages over the thigh wound, which became slightly chafed and infected. The infection, however, was easily controlled. The dressings employed were chinosol gr. i. to ʒi., alternated daily with carbolic acid solution 2 per cent. The dog has since regained his old spirits and put on flesh. The leg carrying the growth was examined by Sir John McFadyean, who pronounced the growth to be a spindle-celled sarcoma. The enlargement of the excised gland was due to dense fibrous tissue, no sarcomatous tissue being discovered.

The object I have in recording this case is to point out the inadvisability of recommending the destruction of pets in such cases if the owner is really anxious for something to be done. In this instance I had recommended destruction, and when operation was decided upon I held out no hope to the owner. I was undoubtedly largely influenced by the enormous wasting and the probability of internal tumours The wonderful recuperative powers of the dog, however, would indicate that my suspicion was not correct, and this is supported by the nature of the growth, since spindle-celled sarcomata would appear to be much less metastatic than the round-celled variety.

AMPUTATION OF A BULLOCK'S LEG AND SUCCESSFUL APPLICATION OF A WOODEN LEG.

BY JOHN CAMERON, M.R.C.V.S., BERWICK-ON-TWEED.

On the morning of May 10, 1907, a truck of store cattle (stirks from Yorkshire) arrived at Berwick-on-Tweed, one of them being down with a broken leg, about the middle of the right metacarpal bone. Being from home all day, it was evening before I saw the case. The leg was then so much swollen that the exact nature of the fracture could not be determined. However, the leg was put in splints and bandages, finishing with a plaster-of-Paris bandage.

The case seemed to be doing well, except that a week later a small abscess appeared at the top of the bandages, close to the knee, which was opened and syringed with disinfectants, this being continued

daily. Up to June 27 nothing special was observed, except that the animal did not make the improving use of the leg which we expected. On this date everything was removed from the leg. The swelling was all gone, but no union had taken place, and a large patch of skin was dead and separated, leaving a large open wound, and revealing a comminuted fracture. The abscess at the knee had a sinus down to the broken parts. I told those in charge that they should have the animal destroyed. Next day the owner was present, but would not have him destroyed, and left orders to have the leg taken off.

On June 30 my son and I amputated the leg at the knee, between the rows of small bones; chloroform having been administered, also

Amputation of bullock's leg.

a tourniquet applied above the knee. The large blood-vessels were ligatured; abundance of antiseptics, cotton-wool, and other dressing materials were applied and allowed to remain undisturbed some days. The same procedure was adopted throughout the healing period, which ran smoothly, and no deviation of any consequence was required. We had to go up that far to get above the abscess opening, and also to get enough of flap to cover the amputated part. The edges of the flap were sutured to the corresponding edges of the leg. At the time it appeared that the skin flap was ample to cover all the amputated surface, but it shrank and was barely enough, thereby taking a little longer to complete the healing process; and even then the healed surface was not so hardy as to bear pressure. We were fitting on a temporary wooden leg on August 11, but a woman who saw the animal and had herself had an arm amputated told me that we were rather quick, and I believe, from the frequent jerky movements of the leg, which

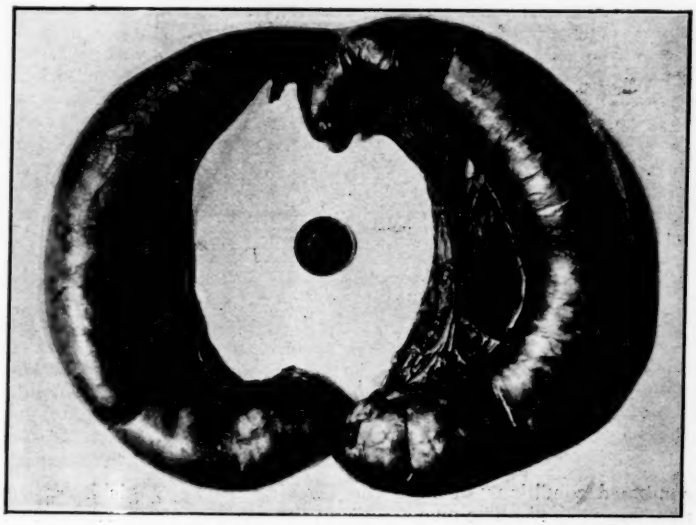
indicated pain, that she was right. Had we amputated all the small bones of the knee there would have been a smaller and easier surface to heal; but, looking to the future difficulties, I considered that the larger a bulbous part there the less would be the difficulty in getting an artificial leg to remain in the position desired. The upper part of the stout, leather socket was in strips, and being bandaged fairly tight on the smaller circumference just above the knee the whole thing was kept from falling off, without having to resort to the aid of a sling round the top of the opposite fore leg and round the chest and neck, as may be required in the case of a dog with fractured humerus, &c. It is, however, hardly possible to design and fix an artificial limb which will be a complete success at the first effort. Such was our experience, and everyone must be guided by the nature of his case. The animal was confined in part of the cart-shed. He got quite accustomed to his new leg, and, having abundance of good foods, he both grew and put on flesh. By the beginning of March he was in excellent beef condition, considered fat enough to kill, and so came to a useful end.

I wish to explain about the photo, but will reserve it for an early future communication.

CHRONIC METRITIS IN A BITCH.

BY GEO. H. WOOLDRIDGE, F.R.C.V.S., R.V.C., LONDON.

A SMALL aged fox-terrier bitch was brought to the college clinic with a distended abdomen. The owner wondered if she was pregnant,



Distended uterus of bitch. (The penny-piece is included for purposes of comparison as to size.)

though he had had her under close observation, and did not know how she could have been "lined."

There had been an occasional drip of blood-stained discharge from the vulva, but it was never copious. On examination a diagnosis of pus in the uterine cornua was made, and hysterectomy recommended. The owner agreed, and the bitch was accordingly chloroformed, and the uterus removed. It was found to be enormously distended, as shown by the accompanying photograph, kindly taken by Mr. Sheather, M.R.C.V.S., Pathological Assistant, a penny being placed alongside for the estimation of size (the diameter of a penny is between $1\frac{3}{16}$ and $1\frac{1}{4}$ in.). The weight of the uterus with its contents was $2\frac{1}{2}$ lb., which is enormous compared with the weight of the bitch, viz., 11 lb. The contents of the uterus consisted of thin purulent blood-stained material, very rich in a great variety of micro-organisms.

CARCINOMA OF THE TESTICLE AND ALOPECIA IN A DOG.

BY GEO. H. WOOLDRIDGE, F.R.C.V.S., ROYAL VETERINARY COLLEGE, LONDON.

THE subject of this note was an aged black Pomeranian dog, weighing 16 lb. He was brought to the college clinic, with the request that he should be destroyed, "on account of the

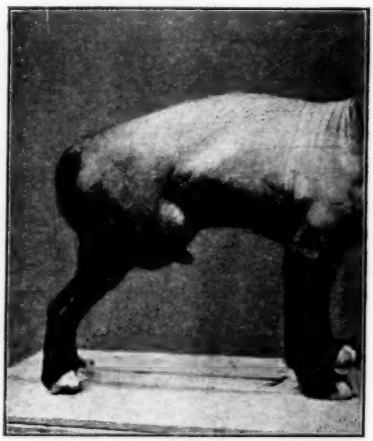


FIG. 1.—Carcinoma of testicle.

combined conditions of age, the swelling between his hind legs, and being bald." The owner thought the swelling was a rupture, and although we informed him that it was a diseased testicle and the dog might live years longer if it were removed, he insisted on his death sentence being carried out. The swelling had been slowly increasing for about a year, being exactly simultaneous with the loss of hair,

though we do not suggest any further connection between the two conditions.

The course of the case is best described in the owner's words: "About a year ago we noticed that the dog was losing some of his hair about the neck, which we thought was probably due to the collar chafing it. We took him to a chemist who has the reputation for being a 'doggy' man (*i.e.*, capable of dealing with simple diseases of dogs). He gave us some condition pills and an evil-smelling salve, which, however, did not seem to have any beneficial effect. Next the dog began to lose the hair on his belly, and it was then for the first time we noticed the enlargement of the testicle. He licked it a good deal,

FIG. 2.—Carcinoma of testicle.

and was pleased when we gave it a gentle rubbing. Then the hair of his back gradually disappeared. Curiously, we never found any loose hair about the house, although he sometimes rubbed himself against table legs, as if itchy. Otherwise, all the way through, the little fellow was in apparent good health, had his usual appetite, and was as lively as could be. His diet consisted of table-scraps chiefly, with biscuits and boiled eggs occasionally, and bones."

The photographs, kindly taken for me by Mr. A. Leslie Sheather, clearly demonstrate the condition of the dog when he was brought to the college. He presented a very curious spectacle, his body being absolutely devoid of hair. There was no apparent irritation of the skin, and no other lesion than loss of hair could be found, the skin being smooth, soft and elastic, and subcutaneous fat ample. The

right testicle was large and firm, and there was no evidence of pain on manipulating it. The left testicle was also slightly enlarged and nodular, and also painless.

On *post-mortem* examination the right testicle was found to weigh 1 lb. 1 oz., and on sections being examined microscopically it was found to be carcinomatous, the diagnosis being confirmed by Sir John McFadyean. No other lesions were found throughout the body, which was in a well-nourished condition.

Abstracts and Reports.

ANTHRAX.[1]

BY H. A. WOODRUFF, M.R.C.V.S., PROFESSOR IN THE ROYAL VETERINARY COLLEGE, LONDON.

ANTHRAX or Charbon is a disease due to the *Bacillus anthracis*, which may affect many animals, most commonly in this country cattle, sheep, pigs, and horses. Historically anthrax has been known from the earliest times, from the time of Moses, when it was probably one of the plagues of Egypt. Geographically it prevails over a very wide area of the globe, ranging from the Arctic Circle to the Equator, and more especially in Russia, Siberia, China, Persia, and Turkey; also in Egypt, over the whole of Europe, in India, in South America, and to a less extent in the United States. Damp valleys, river-beds, low-lying fen-land—these are particularly favourable situations.

Bacillus anthracis.—The *Bacillus anthracis*, seen by Pollender and Braul, 1849-50, described by Davaine in 1863, and its *rôle* in the causation of anthrax further elucidated by Pasteur and Koch, is a non-motile rod-shaped organism, with apparently square ends, which, however, on high magnification, are seen to be rounded, the whole surrounded with a hyaline envelope. In the blood, in which immense numbers of bacilli are constantly found in animals shortly before death, they occur as short stiff rods made up of three or four segments joined together, and have a total length of from 5 μ to 20 μ. Longer threads are rare in the blood, but are commonly found in lymphatic glands and other extra-vascular situations. The bacillus grows well in bouillon, and on all ordinary culture media forming long threads. It is strictly aerobic, and it is often called a facultative parasite, in that it may multiply vegetatively outside the animal body; but in practice this is unimportant. What is of the utmost importance is its power of sporulation.

Sporulation.—The formation of spores is a characteristic feature of anthrax bacilli, but it only takes place under certain conditions. Sporulation never occurs in the blood or tissues of a living animal; it requires a certain amount of heat, namely, between 21° and 40° C., and also free exposure to oxygen or air. This being so, spores are not formed in the blood or tissues of an animal dead of anthrax, unless the body is opened and the bacilli in the blood are exposed to air and warmth.

[1] Read before the Veterinary Section of the Public Health Congress at Buxton. Abstracted from the *Buxton Advertiser*.

Resistance.—The vital resistance of anthrax bacilli and spores to the ordinary germicidal agents is a matter of great practical importance, the spores being much the more difficult to kill. To *disinfectants* the bacilli are not very resistant, and 5 per cent. carbolic acid solutions destroy them in a few minutes. For the spores a much longer time is necessary, at least several hours for material containing spores, and it is better to consider twenty-four hours a safe time limit. Perchloride of mercury, 1 in 1,000, is very reliable for bacilli if it comes in contact with all parts of the substance containing them, but it does not penetrate much, and oil, fat, or albumen makes a protective envelope in which the bacilli may escape. For spores immersion for several hours is necessary. Such agents as creolin, izal, and lysol act in much the same way as carbolic, and are even more efficient. The bacilli are killed at a temperature of 100° C. dry heat, or by cooking the tissue containing them at 70° to 80° C. for one hour. Spores require 100° C. moist heat for several minutes, or superheated steam at 120° C. for a few seconds. Putrefaction of a carcase soon affects the bacilli from want of oxygen; growth stops, they cease to stain well, gradually disintegrate and disappear, whilst other putrefactive organisms swarm in the tissues, *e.g.*, the malignant œdema bacillus. These changes occur latest in the blood of the extremities, so that in the ear or foot anthrax bacilli can be recognized for about twenty-four hours after death even in summer weather. *Burial.*—Although there is some circulation of air to a depth of 3 or 4 ft. in certain porous soils, it is not sufficiently free to allow of sporulation taking place after burial, and, in fact, shallow burial of an intact animal dead of anthrax, or even allowing it to lie exposed on the surface of the ground, does not promote sporulation so long as the carcass remains intact until putrefaction is advanced, and provided no discharges of blood or other body fluids have occurred (from mouth, nostrils, anus, &c.). Pasteur advanced the theory that earthworms played an important part in spreading anthrax by ingesting anthrax spores from a buried carcase, bringing them to the surface and voiding them in their casts. For the reasons given above this is not likely to be a common source of danger. Similarly water draining away from the burial place is not a very probable carrier of infection, because of the impossibility of sporulation in an intact animal. On the other hand, shed blood or any discharge from the body of an animal infected with anthrax is highly dangerous, and if sporulation occurs the infection may be carried in numerous ways.

Staining.—It is unnecessary to describe in detail the various methods of staining anthrax bacilli; sufficient to say they stain well in the blood or in cultures with basic aniline dyes, and by Gram's method, and may be identified by their morphology, cultural characters, and, if necessary, by inoculation of a guinea-pig. McFadyean has introduced a very useful macroscopic test for a film of anthrax blood. The film is just fixed (over-heating prevents the typical reaction), then stained with a 1 per cent. aqueous solution of methylene blue, the stain being left on for a few seconds. The excess of stain is then washed off in water and the film allowed to dry. In a case of anthrax the film will be of a metallic purple colour when seen by reflected light, in place of the greenish-blue colour of a film of non-anthrax blood. This reaction is not absolute, but it is effective in the great

majority of cases. Presence of the typical colour is positive evidence of anthrax, but absence of the typical colour is not absolute evidence that anthrax is absent.

Symptoms in Animals.—The symptoms shown by an affected animal differ somewhat in the different species. Cattle show fever, dyspnœa, cyanosis, and although some do recover, more usually death occurs within thirty-six hours. In sheep the symptoms are more acute, the mortality is higher—in fact, recovery is rare—and death usually takes place in from twelve to twenty-four hours. In the horse anthrax is usually fatal in twelve to twenty-four hours, with symptoms of enteritis and some colic, less often some swelling about the throat. In the pig there is most often a swelling about the throat indicating the mode of entrance (ingestion) of the infection. In all these cases it is very common to have the sudden death of one animal without much or even any warning. In such a case, where anthrax is suspected, the procedure is to examine the blood, taken preferably from the ear or foot, before making a complete *post-mortem*, and if anthrax is found no *post-mortem* must be made, since shed blood and other discharges exposed to air and sunlight provide the readiest means for sporulation and subsequent spread of the disease.

Lesions.—It is, however, necessary to be acquainted with the common lesions both for meat inspection and in case of an inadvertent *post-mortem*. In all animals, early putrefaction; a frothy blood-stained discharge from mouth, nose, and anus; black tarry blood which will not easily clot; these are strong indications. In addition, in cattle the spleen is almost invariably greatly enlarged and semi-fluid, less commonly so in sheep; whilst in the horse the common symptom is hæmorrhagic enteritis, with marked congestion of all the intestinal veins and gelatinous thickening of the bowel wall. In the pig, swelling of the throat and pharyngeal region, with a gelatinous exudate infiltrating the tissues, is sufficiently indicative. Since the bacilli are present in countless numbers in the blood before death, all the tissues and discharges from any of the above animals affected will be infective. In all cases where animals are suspected of being, or are affected with anthrax, the local authority for the purposes of the Contagious Diseases (Animals) Act of 1894 has to be notified, and they supervise the destruction of the carcase, disinfection of the premises and inspection of all in-contact or other animals on the farm until danger of a further outbreak is over. Susceptible animals in foreign countries providing sources of infection by means of animal products, such as wool, hair, horn, and hides, are sheep—all except Algerian sheep, which are usually immune—goats, camels, horses, and cattle; dogs, though not immune, are relatively insusceptible, and practically need not be considered as sources of infection.

Protective Inoculation.—Various methods of protective inoculation have been tried, the one most generally used being that introduced by Pasteur. This consists in vaccination with attenuated cultures of two strengths—a weak first vaccine being followed by a stronger second vaccine in about fifteen days time. The method has been largely used in France with considerable success. Its weak points are: (1) that the immunity conferred only lasts about nine months, and (2) that there is no method of attenuating spores, and if by any chance spores have formed the vaccine will set up an ordinary attack of

anthrax. There have sometimes been in this country 10 per cent. of fatalities among animals vaccinated.

Methods of Infection.—From what has already been stated it is evident that the chief element in the perpetuation of anthrax is the formation of the very resistant spore, and so the duration of the virulence of infective material depends on suitable temperature and free access of oxygen. The bacilli, apart from spores, are most likely to be the infective agents when fresh anthrax blood is inoculated into another animal. The three common modes of infection—by inoculation, by inhalation, and by ingestion of infective material—all occur in the case of anthrax, ingestion being much the commonest. In animals the cause is usually the ingestion of anthrax spores from shed blood of another animal, in grass, or hay (often in the horse), in straw or in oil-cake (Russian linseed cake), or in particles of soil off a pasture. The pig is sometimes infected by the ingestion of entrails and viscera of another animal dead of anthrax. Land may be infected by trade effluents, factory waste, &c., brought in rivers or streams from factories where wool, hair, or hides contaminated with anthrax spores have been used.

Infection in Man.—In man infection may occur from the handling of any animal products ("wool-sorters' disease"), such as wool, hides, bristles, hair, or horn, in factories, for the spores of anthrax may be inhaled or swallowed, or sometimes may penetrate some wound of the skin—pimples, scratches, cuts—and cause a local lesion. Not infrequently in this country farm labourers and the like are inoculated with infected blood during the dressing or opening or burial of an animal which has died suddenly from no apparent cause. Again, the eating of meat of an anthrax carcase may produce the disease unless the cooking has been very well done.

Prevalence in Man.—"For the six years from 1889 to 1904 there were 261 cases of industrial anthrax (in man) reported to the Home Office; 25·6 per cent. proved fatal" (Legge). These figures only apply to cases controlled by the Factory Acts.

Preventive Measures.—Thus, to reduce the problem to its simplest terms, the dangers of infection with anthrax are due to (1) the fresh blood and tissues of an animal dead of the disease, and (2) anthrax spores derived from blood and present in soil, in animal products, such as hides, hair, and wool, or in forage such as hay, corn, or cake. The prevention of infection by the former method depends on care in avoiding *post-mortem* examinations in suspicious cases until proved "not anthrax" by examining the blood, and by efficient meat inspection.

The prevention of infection by spores is infinitely more difficult and at times impossible, because of the great resistance of anthrax spores to ordinary methods of disinfection, and because of the great prevalence of anthrax in many districts from which wool, hair, hides, &c., and also forage of various kinds, are imported. In the case of foreign hay or oil-cake nothing can be done except to destroy the remainder of the forage where a case of anthrax has occurred and can be traced to such forage. In the case of animal products many methods are adopted in factories under Home Office regulations, whereby the danger is lessened and made minimal. These, in brief, consist, for horse-hair from China, Siberia, and Russia, in (1) registration of all such material imported into the factory; (2) disinfection of

the same, when opened out, by means of steam at 212° F. for half an hour, or by a disinfectant certified strong enough to kill anthrax spores, the details to be entered in the register; (3) provision of fans with exhaust draught in the rooms where the opening out of the material, prior to disinfection, takes place; (4) the burning of all dust extracted by the exhaust fans; and (5) the provision of respirators and overalls for the persons employed, with suitable accommodation for washing, for meals, &c.

In the case of wool, goat-hair, and camels' hair, the regulations require that (1) every bale shall be thoroughly steeped in water; (2) it shall be opened over a screen with strong exhaust draught; (3) fallen or damaged fleeces are to be damped with a disinfectant and washed; (4) where necessary certain kinds of hair must be sorted whilst in the damp state; (5) the floors in the opening and sorting rooms shall be sprinkled daily with a disinfectant; (6) accommodation for the workers shall be provided as that described above.

Such are the preventive measures adopted, and that they greatly lessen the likelihood of infection with anthrax cannot be doubted. In so far as they fail, the failure appears to be due to the great resistance of anthrax spores; to the difficulty of getting any disinfectant agent to penetrate every part of the material submitted to it; to the fact that really efficient disinfection is in many cases impracticable because of its ill-effects on the material itself; and, lastly, because some amount of handling is necessary before the steeping and disinfection can take place.

(*To be continued.*)

ANIMAL DISEASES IN THE CAPE OF GOOD HOPE.[1]

THE following Assistant Veterinary Surgeons are at present serving as Veterinary Officers on the Technical Staff:—

R. W. Dixon, M.R.C.V.S., East London; M. A. Hutchence, M.R.C.V.S., Kokstad; G. W. Freer, M.R.C.V.S., Uitenhage; J. Spreull, M.R.C.V.S., Koopmansfontein; J. A. Robinson, M.R.C.V.S., Mossel Bay; A. Goodall, M.R.C.V.S., Worcester; C. Goundry, M.R.C.V.S., Aliwal North; J. H. Lyons, M.R.C.V.S., Grahamstown; W. G. Pakeman, M.R.C.V.S., Molteno; S. Elley, M.R.C.V.S., Oudtshoorn; R. Paine, F.R.C.V.S., Elsenberg, Mulder's Vlei; P. X. Kearney, M.R.C.V.S., Umtata; W. Simson, M.R.C.V.S., Mafeking; W. Jowett, F.R.C.V.S., D.V.H., Cape Town; [2] R. W. Stephenson, M.R.C.V.S., King Williamstown; [2] J. A. Worsley, M.R.C.V.S., Butterworth; and J. D. Borthwick, Chief Veterinary Surgeon.

SUMMARIES OF ANIMAL DISEASES OUTBREAKS DURING 1907.

As compared with 1906, there has been a total increase of 162 outbreaks of the various animal diseases scheduled under Act No. 27 of

[1] Abstract from the Report of J. D. Borthwick, the Chief Veterinary Surgeon, for the year 1907.

[2] Services started on March 23 and September 1, 1907, respectively.

1893. This increase is almost wholly due to the increase in the number of outbreaks of lung sickness, amounting to 151. Glanders shows an increase of twelve over last year, while epizootic lymphangitis and tuberculosis have increases of twelve and ten respectively. Redwater and scabies remain the same as for the preceding year, while anthrax shows a decrease of three, and sponsziekte of nineteen outbreaks. There have been no outbreaks of swine fever this year.

The increase in the number of deaths amongst affected herds is due in the most part to lung sickness, although anthrax, glanders, redwater, sponsziekte, tuberculosis, and epizootic lymphangitis also show increases in this respect.

The percentage and average number of deaths per outbreak is higher than last year in all the scheduled diseases, with the exception of epizootic lymphangitis, which shows a marked decrease. Glanders, although showing a higher average number of deaths, has a much lower percentage.

With regard to the percentage of average number of deaths, I would point out that the figures are worked out on the actual details as received from the Resident Magistrates of the various districts, but in several cases it was found to be practically impossible to ascertain the exact number of animals concerned, more especially where many herds, as in native locations, were involved, and the percentage and average number of deaths per outbreak must therefore be taken as being actually lower than those shown in the attached tables.

Anthrax.

This disease during the past year has caused considerable loss amongst cattle, but fortunately does not prevail much in our small-stock farming area. I regret, however, that farmers do not avail themselves more readily of protective inoculation, which has proved such a success, the number of inoculations being only 5,500. In connection with this disease, Veterinary Surgeon Simson, of Vryburg, reports: "Preventive inoculation has proved so satisfactory that it is done annually on many farms where deaths occurred in former years from this disease. In one instance that came under my observation many deaths occurred among a herd of cattle in the Dry Harts Valley, owing to the owner not detecting disease or reporting deaths; however, after inoculation the disease ceased."

And Veterinary Surgeon Kearney, Transkei, reports: "These deaths occur so rapidly that there are great opportunities to conceal altogether or report 'gall sickness,' and thus escape the inconvenience of the quarantine restrictions; as a consequence owners bear the loss, say nothing, and do nothing. As the quarantine which can be imposed here is ineffective, and as each place, in my opinion, is as much infected as another, I would suggest, if I might, that owners reporting the disease and having their cattle inoculated should only be quarantined until the second vaccination had been completed. I think in this way owners would be encouraged to report and inoculate."

Epizootic Lymphangitis.

During the year twenty-one cases were reported, five of which died or were destroyed, the remainder recovering.

In connection with the treatment of this disease, Veterinary Surgeon

Freer, Uitenhage, reports: "An outbreak of epizootic lymphangitis was also discovered at Humansdorp. In these cases, I find that the administration of mercuric potassium iodide, combined with antiseptic local treatment, is effectual in ninety-nine cases out of a hundred."

Glanders.

This disease now comes under the Animal Diseases Act, No. 16 of 1906, which provides, in the case of glanders or farcy:—

(1) To cause the immediate destruction of the animal or animals found by the Board convened under Section 9 of the said Act to be visibly infected, compensation being payable to the owner of an amount not exceeding one-third of the value of the animal before infection, such compensation to be assessed by the said Board, and in no case to exceed £25 sterling for any one animal.

(2) To cause all animals which have been in contact with infected animals, and are liable to be infected, to be tested with mallein by or under the supervision of a Government veterinary surgeon or other officer thereto specially authorized in writing by the Minister, and to be isolated under quarantine.

(3) Any of the in-contact animals that react to the mallein test must be isolated under quarantine and destroyed on developing the disease in visible form.

This Act has been found to give every satisfaction, and is greatly appreciated by horse-owners. Although the number of cases reported and dealt with seems large, I think we may be hopeful that the disease will soon be under control. The fact of compensation now being paid tends to early reporting of the disease, and thus stopping its spread.

Veterinary Surgeon Paine reports: "Only one outbreak has been brought to my notice, namely, in the Piquetberg District; in this outbreak there was evidence of farmers selling an obviously sick horse, it having passed through no less than five hands after it had developed definite lesions. This entailed the testing of 135 animals; eleven animals were found to be affected on the various farms, and several deaths had also occurred prior to my visits."

Veterinary Surgeon Jowett reports: "In Cape Town and district but few outbreaks of this disease have occurred during the past year. Clinically-affected subjects and those which react to mallein inoculation are promptly slaughtered—all in-contacts are tested, and the premises disinfected. This method answers very well, and the disease appears to be quite under control at the present moment.

"At the commencement of the past year it fell to my duty to deal with one or two considerable outbreaks of glanders amongst horses and mules in the Caledon and Bot River Districts; as a result of my experience in these and other cases I arrived at the conclusion that: (1) When re-testing doubtful reactors with mallein, it appears unnecessary to delay the second test for a period longer than a few days, or, in other words, a period sufficiently long to allow of the return to normal of the temperature elevated in consequence of the first infection of mallein. (2) Of the two reactions, thermic and local, the former appears to be the more delicate and precise, and the one less likely to lead to erroneous conclusions."

Lung Sickness (Pleuro-pneumonia).

The Animal Diseases Act Amendment Act No. 16 of 1906 was promulgated to take effect in the Colony proper on February 1, on which date a start was made to eradicate this disease. The Act provides for the slaughter of all infected animals and the inoculation of all in-contacts, with compensation for those slaughtered of an amount equal to one-half of the value of the animal before infection. After eleven months trial of the new Act, from the results obtained, I think it can be claimed that considerable progress has been made towards the eradication of the disease within Cape Colony. During the month of December only fourteen fresh outbreaks were reported, involving six districts; seeing that the disease has been prevalent in twenty districts during the year, such a state is so hopeful as to enable us to continue our combat with the disease with renewed energy.

The great danger of re-infection to which the Colony is subjected by the adjoining territories of the Transkei will necessitate further restrictions being placed on transport oxen from those territories. The compulsory slaughter of infected animals not being in force in the Transkei, animals are allowed to recover, and become a source of great danger when used as transport oxen to and from the Colony. In the Transkei inoculation with prepared and crude virus was resorted to, with, on the whole, marked success. The inoculations performed by Government inoculators numbered 107,010, and as there were a large number of officially recognized private inoculators whose returns are not included, the inoculations performed must total at least 300,000.

Veterinary Surgeon Kearney, Transkei, reports: "The greatest misfortune, and, I consider, the greatest reason for the continuance and spread of the disease in these parts, is the fact that the native will not isolate his sick from his healthy cattle; the marvel to me is that the losses are not greater. Frequently, on going to inoculate, I have seen sick cattle—and these were well known to be sick—in the same kraal (and these kraals are very small) with the healthy cattle; they graze together and are kraaled at night together.

"On one occasion I had a native constable stationed at the kraal to insist that the sick ones were kept isolated and tied up, but on making a surprise visit the dusky constable could not be found—beer-drinking, I suppose—and a sick beast was standing loose alongside the road. As a rule, the native laughs at the idea of isolation, and argues that there is no use in him isolating and tying up sick animals, as his neighbour will allow both his healthy and his sick cattle to mix with his.

"In many ways the epidemic has been remarkable, but in none more than in the varying results of caudal inoculation. It is safe to say that in comparatively few cases only did the signs of 'taking' occur within ten days, whether the virus used was 'local' or prepared, and in my experience I found about the fourteenth day the most critical time, and from that day on to the fourth week and longer the person attending to the tails had an exceedingly busy time. In a very considerable number of cases, with absolutely no sign whatever about the tail, the glands at the root of the tail swelled up with a large inflamed area around them, and these cases, unless treated immediately

continuously, and drastically—I found blistering severely with ung. hydrarg. biniod. 1 to 4 very good—generally proved fatal. In these cases, again, the natives generally wait until it is too late before reporting them or dealing with them."

Quarter Evil (Sponsziekte).

It is encouraging to notice the increased desire to make use of protective inoculation, 9,640 doses having been used last year. I have no sympathy with those farmers who will persist in waiting for a case before resorting to inoculation, as is so frequently done. These protective inoculations should be attended to at the proper time, just as the sowing of the mealie crop or mating of the stock.

Veterinary Surgeon Kearney, Transkei, reports: "Towards the end of the year very serious losses from quarter evil have occurred about Umtata, and I have inoculated many herds with the different forms of the vaccine, and, from what I can hear up to the present, with very good results. I am making every endeavour to point out to owners here the necessity for inoculating their young stock annually as they come on, and thus not only save their stock, but prevent the more and more extended infection of the veld which is now going on, with its certain legacy of future loss."

Alveolar Periostitis.

Veterinary Surgeon Paine reports as follows: "I have been asked for advice with regard to a condition seen in these districts in young horses, generally at the age of about 3 years, namely, enlargement of the facial bones, accompanied with retention of the temporary premolar teeth, and if neglected, with suppuration at the roots of the permanent premolars, followed in some cases with the abscesses bursting on the external surface of the bones.

"The condition has apparently been observed in this area for some years, and has been locally treated with reported success by knocking off the temporary teeth; but if the cases are not attended to in the early stages, the animals never grow out properly, and are quite useless. Since this condition apparently only occurs in our forage districts, where young horses are allowed to eat bearded forage, such as wheat chaff, I am inclined to believe that the sole cause is the penetration of these barbs into the tender gums of the young animal, and that they afterwards work their way up between the teeth, and so set up inflammation of the alveolar periosteum. I am not inclined to connect it in any way with bone disease (*osteoporosis*), and have tried to impress upon the owners the necessity of feeding their young stock upon a more suitable diet."

Ephemeral Fever or Three Days' Sickness.

This disease has been widespread during the last two months of the year. In 1906 this disease appeared in Rhodesia, and early in 1907 a few cases occurred in Bechuanaland and Griqualand West. The symptoms of this disease are:—

Symptoms.—The earliest indications of attack are an elevation of temperature, with slightly increased salivation and roughened appearance of the coat. In a few hours these symptoms become aggravated, the temperature may run up to over 107° F., salivation is more

pronounced, the mucous membrane of the mouth becomes reddened and the eyes injected, breathing and pulse are hurried, rumination is suspended, the affected animal ceases to feed and occasionally grinds its teeth, the bowels may be relaxed or slightly constipated, there is extreme muscular stiffness, with great disinclination to move and apparent lameness, the animal standing with its back arched, and moving with difficulty. Occasionally an affected animal lies down, and is either unable or unwilling to rise. With development of these symptoms the temperature appears to subside rapidly. In about forty-eight hours the appetite returns, the symptoms gradually disappear, and the animal soon becomes convalescent, so that the term "three-day sickness" is somewhat appropriate.

Mortality.—The mortality from this disease appears to be small. In Rhodesia not more than 1 or 2 per cent. of deaths were reported, while in this Colony and in the Transvaal, so far, none have been recorded.

Treatment.—The administration of a dose of laxative medicine, preferably Epsom salts, appears to be all that is necessary, but it is almost preferable to leave them alone.

Manner of Spread.—Up to the present nothing is known of the manner in which this disease is spread.

Veterinary Surgeon Simson reports: "This disease appeared among cattle from February to middle of May. Briefly, the symptoms were high fever, frequently, but not always, accompanied by lameness in one or more limbs, with disinclination to move. Worst cases were paralyzed, some to the extent of lying flat on side, with fœtid smell in mouth. Several passed blood and mucus on fæces, but probably former was due to being rather constipated. Mortality was very low, as I never saw any fatal cases.

"Recovery, even in severe cases, was very rapid. In one instance a bullock lying flat on side, unable to rise or lift head, with high fever, was found grazing with herd about three miles away twenty-four hours later.

"Majority of cases received no treatment by owners, but probably a laxative drench is beneficial, as I administered same in severe cases. Worst cases, when unable to rise, are not unlike lamziekte, but the several cases of lamziekte that I examined showed 'subnormal temperature and slow pulse.'"

Swine Fever.

It is gratifying to report that this disease has been stamped out, not a single case having occurred during the past year.

This disease is at present costing Great Britain an expenditure of some £50,000 per annum.

East African Coast Fever.

This Colony still remains free from this disease, but as the diseas is rapidly approaching our Cape-Natal border we are in imminent danger. Stringent measures have been adopted to guard the border of the Transvaal and Natal, and the erection of the fence between Alfred County, in Natal, and Pondoland is being pushed on with all possible speed.

UNIVERSITY OF LONDON.

INTERMEDIATE EXAMINATION IN VETERINARY SCIENCE (Part I.). FOR EXTERNAL STUDENTS. JULY, 1908.

Examiners.—Organic Chemistry: J. A. Gardner, Esq., M.A., F.I.C., and J. E. Purvis, Esq., M.A., A.R.C.S., F.I.C., F.C.S.

Veterinary Anatomy: O. C. Bradley, Esq., M.D., D.Sc., M.R.C.V.S., and E. S. Shave, Esq., M.R.C.S., L.R.C.P., F.R.C.V.S.

Biology: F. E. Beddard, Esq., M.A., F.R.S.; T. G. Hill, Esq., A.R.C.S., F.L.S.; Prof. M. C. Potter, M.A., F.L.S., and W. G. Ridewood, Esq., D.Sc.

Pass List:

Graves, Thomas Chivers, Royal Veterinary College.
Sheather, Alfred Leslie, private tuition.

PRELIMINARY EXAMINATION IN VETERINARY SCIENCE. FOR INTERNAL AND EXTERNAL STUDENTS. JULY, 1908.

Examiners.—Inorganic Chemistry: J. A. Gardner, Esq., M.A., F.I.C., and J. E. Purvis, Esq., M.A., A.R.C.S., F.I.C., F.C.S.

Experimental Physics: Frank Horton, Esq., D.Sc., M.Sc., M.A., and Prof. F. Womack, M.B., B.Sc.

Pass List.—Inorganic Chemistry and Experimental Physics:

Edwards, James Thomas, Royal Veterinary College.

Inorganic Chemistry only:

Horton, Frank Fielding (*p*), Royal Veterinary College.

(*p*). *This candidate has already passed in Experimental Physics.*

AMERICAN VETERINARY MEDICAL ASSOCIATION.

THE forty-fifth annual meeting of the American Veterinary Medical Association is being held this month in Philadelphia on the 8th, 9th, 10th and 11th, under the presidentship of Dr. W. H. Dalrymple, of Baton Rouge, Louisiana. The programme, which is a very comprehensive and instructive one, commences with addresses of welcome by the Hon. J. E. Ryburn, Mayor of Philadelphia, and Vice-Provost Edgar F. Smith, of the University of Pennsylvania.

The papers to be discussed are as follows:—

(1) "The Important Relation of the Veterinarian to the Public Health." By Fredk. J. Moyer, M.D., Special Medical Inspector to the Louisiana State Board of Health, New Orleans.

(2) "The Transportation of Live Stock." By N. S. Mayo, Santiago de las Vegas, Cuba.

(3) "Shipping Fever of Horses." By C. H. Jewell, Artillery Corps, Fort Riley, Kansas.

(4) "Glanders in the Metropolitan District." By H. Gill, of New York City.

(5) "A Clinical Examination of the Blood of Glandered Horses." By S. H. Burnett and C. D. Pearce, Ithaca, N.Y.

(6) "The Eradication of Cattle Ticks in the South." By W. P. Ellenberger, Nashville, Tenn.

(7) "The Work of the Bureau of Animal Industry in the Control and Eradication of Cattle and Sheep Scabies in the Western States." By Robert Ramsay, Department of Agriculture, Washington, D.C.

(8) "Experiments on the Prevention of Hog Cholera." By J. W. Connaway, Columbia, Mo.

(9) "The Control of Hog Cholera by Serum Immunization." By A. D. Melvin, Chief of the Bureau of Animal Industry, Washington, D.C.

(10) "Opsonic Therapy." By Robert Archibald, Oakland, Cal.

(11) "The Bier Treatment." By S. J. J. Harger, Philadelphia.

(12) "Notes on Rabies." By John Newton, Toledo, Ohio.

(13) "Trypanosomes and Trypanosomiasis." By Harry Smith, Albion, Md.

(14) "Pustular Eczema." By F. C. Grenside, New York City.

(15) "Milk and Milk Inspection." By Courtney Leon, Meadville, Pa.

(16) "Hygiea not the Child of Æsculapius." By Lloyd Champlain, Kansas City.

(17) "Tuberculosis." By Burton Rogers, Manhattan.

(18) "The Army Veterinarian and Others." By G. E. Griffin, 3rd Artillery.

(19) "Diphtheria of Man and Animals." By C. C. Lyford, Minneapolis.

(20) "Diseases of the Mammary Gland of Cows." By Horos Jensen, Weeping Water, Nebraska.

(21) "The Pathological Effects of Captivity on Wild Animals." By W. Reid Blair, New York.

(22) "The Making of American Veterinary History." By Dr. Arthur Hughes, Chicago.

(23) "Our Personal Responsibility to the Profession." By Chas. G. Lamb, Denver, Colorado.

(24) "Pyæmic Arthritis." By J. Spencer, Blacksburg, Va.

(25) "The Significance of Pathology to the Practitioner." By A. T. Kingsley, Kansas City.

(26) "Shifting Lameness." By G. R. White, Nashville.

The fourth day is entirely set aside for practical demonstrations, the meeting being held in the clinical wards and surgical operating theatre of the Veterinary Department of the University of Pennsylvania, and amongst the operations to be performed are the following: Resection of the plantar aponeurosis, resection of the lateral cartilage, stringhalt operation, operation for bog spavin, oöphorectomy of cattle, and various dental operations. The operators include such well-known names as Drs. W. L. Williams, Berns, A. H. Barber, G. R. White, Merrillet, Harger, Adams, C. E. Cotton, Gill, and Hoffman.

Personal.

Mr. G. E. Bowman, Leeds, has been unanimously elected President of the National Veterinary Association for next year. Mr. J. F. Simpson, Maidenhead, was elected Treasurer in place of Mr. F. Wragg, deceased. The 1909 meeting of the National Veterinary Association is to be held at Harrogate.

Professor A. Degive has resigned the Directorship of the Belgian State Veterinary School at Brussels, and Professor Dupuis has been appointed to fill the vacancy.

Mr. H. Brassey-Edwards, M.R.C.V.S., formerly tutor in the Royal Veterinary College, London, has been appointed to the veterinary staff of the Egyptian Government, and will take up his duties at Cairo at the beginning of October.

Translations.

A CURIOUS CASE OF INTESTINAL INVAGINATION (ILEUM) IN THE DOG.[1]

BY M. L. COLLET, VETERINARY SURGEON, ANTWERP.

On November 9, 1907, I was called by M. B., of Antwerp, to attend to a pointer, aged 6 months, affected with hæmorrhagic diarrhœa. I examined the animal, and found pulse, temperature, and mucous membranes normal, not the least trace of depression; on the contrary, the patient was very lively, and appetite excellent. The owner told me he believed that his dog had eaten the remains of a rabbit that had been buried some time in the garden. With this history, I treated the symptom "diarrhœa" by dieting, and as medicine gave laudanum and salicylate of bismuth. Improvement occurred after some days, the blood in the motions disappeared, but the latter remained soft.

On the 15th they became very liquid again. The general state of the dog was good, but he gradually got thinner. Treatment by way of the stomach giving no result, I ordered and administered repeated opiated fomentations to the base of the abdomen, followed by tannic acid and borate of soda internally.

On the 17th the appetite failed, and on the 20th I took the dog to my place to observe him better and to give him his medicine regularly. At this time lack of appetite was very noticeable, and I had to nourish the patient by giving eggs and milk.

On the 23rd there was a passing improvement, the dog eagerly eating some raw meat, which made me imagine the crisis was over, but I was wrong. On the morrow he refused all food, his general state became worse, his thinness pronounced, and, as a complication, he became comatose. He would not leave his corner, and swallowed fluid nourishment with difficulty. I continued the fomentations; the

[1] Read before the Veterinary Society of the Province of Antwerp, February 16, 1908.

mucous membranes were anæmic, abdomen tucked up, and exploration did not enable me to localize the trouble. I kept the animal alive for three days by hypodermic injections of artificial serum, and on the 27th I found him dead in his place.

The autopsy was interesting. On opening the abdomen we found no peritonitis, the intestines were full of a yellowish liquid, the remains of the milk and eggs administered. We were very surprised to find invagination of the ileum exactly at its termination for an extent of 8 cm. It had been stopped in its invagination by the mesentery at the entrance of the cæcum. The invaginated portion was thickened, red, and turgid, its lumen hardly allowing the passage of a probe cannula; in the rest of its extent the intestine presented enteric lesions (mucous membrane thickened in places, thinned in others, and little ulcers here and there).

Invagination had thus been the cause of complete intestinal occlusion. What rendered the case peculiar to me and singular was that the lesion had not occasioned the classic symptoms: constipation, swelling, vomiting, &c. One cannot consequently admit that it occurred at the commencement of the illness, but that it probably arose when the dog appeared better, about four days before death occurred, and that he was then in such a miserable physiological state that the grave state of invagination caused no reaction, and passed unperceived. The case appeared interesting enough to record, seeing that its special genesis and absence of particular symptoms gave one no reason for suspecting the existence of such a grave lesion, which was a veritable surprise at the autopsy.—G. M.

(*L'Echo Vétérinaire.*)

VENTRAL HERNIA IN A HORSE.

BY VENTSKI.

Whilst exercising, a horse fell on the stump of a broken lance, which only seemed to cause a superficial scratch in the region of the flank and abdomen on the near side. No bad symptoms were observed, and the wound was treated by ordinary means. Five hours later a swelling appeared at a level with the flank, and rapidly became as large as a child's head, and attached to the abdominal wall by a large pedicle. Palpation caused great pain, and auscultation revealed borborygmus.

Diagnosis—abdominal hernia. Alimentary matters appeared normal and defæcation all right. To benefit the hernia, a laxative and sloppy diet was given. On account of the risk of eventration, it was decided not to open the hernial sac. A truss was therefore put on with two pads. One pad rested on the lower portion of the sac, pushing it up towards the skin; the other pressed directly on the hernia, with the object of closing the hernial ring. When the truss was properly fixed, the horse was put in slings. Slight and fugitive colic appeared on the second day. Œdema occurred round the compressed hernial sac, but disappeared in six days. The swelling gradually declined. In five months it had almost completely disappeared; it was painless, and the horse was put to saddle work.

(*Zeitschrift für Veterinärkunde.*)

AN INTERESTING CASE OF CHRONIC VALVULAR ENDOCARDITIS IN THE HORSE.

BY PROFESSORS JOEST AND ROEDER.

A HORSE, aged 4, at the commencement of July showed œdema of the limbs, which disappeared under the influence of appropriate treatment, but reappeared some days after. Then the subject became sluggish and fatigued at light work. The state of things got worse at the end of September; at this period the horse was incapable of the least effort, and lay down even during light exercise. The swelling of the legs increased greatly. The temperature reached 41·7° C., and the pulse 90 to 100 per minute. The heart beats were intermittent, and there was a venous pulse. Appetite failed.

The diagnosis was valvular endocarditis. Administration of digitalis, camphor and caffeine, lessened the swellings and improved the general state; but in October the patient got worse again. Temperature varied between 41° C. and 41·5° C.; pulse 105. Auscultation of the heart was difficult, as the beats ran into each other. At the entrance of the chest, on a level with the carotids, one heard a clapping sound in systole. When one tried to make the patient walk, he extended his head and dilated his nostrils as if suffocated; his look became anxious, and after a few steps his hind-quarters gave way. At this time the pulse could not be counted. Percussion indicated fulness in the cardiac zone. Mucous membranes cyanosed; urine bloody. On account of the gravity of the case the horse was slaughtered at the end of November.

Autopsy.—General hypertrophy of the heart; pericardium healthy; right auricle much dilated. The chordæ tendinæ of the mitral valve were shrunken and shortened; their edges were thickened by adherent fibrinous clots and vegetations. The aortic valves were fixed between them and unified by new growths and a deposit of fibrin; the valvular chords were also thickened. The tricuspid valve showed identical lesions; and pulmonary valves were healthy. The myocardium showed at different points, when cut, foci of fatty degeneration, especially at the level of the right heart. Kidneys: The left hypertrophied and congested in places; right one much enlarged, its capsule thickened and covered with fibrinous membranes. Its substance was the seat of numerous hæmorrhagic infarctions, and its hilum contained mucopurulent liquid. The renal artery completely occluded by a clot at its entrance to the organ, the clot adherent to the wall of the vessel.

Histological examination gave chronic interstitial nephritis, more pronounced in the right organ; degeneration of the liver.

Summarizing: There was valvular endocarditis, with mitral insufficiency and stenosis of the left sigmoids, hypertrophy of the cardiac cavity, fatty degeneration of the myocardium; thrombosis of the right renal artery, and formation of embolic areas; degeneration and double chronic interstitial nephritis; parenchymatous degeneration of the liver.

Endocarditis was, without doubt, the primary cause of the symptoms. The nephritis had complicated it by embolic phenomena, as well as fatty degeneration of the myocardium, due to thrombosis of the coronary arteries.—G. M.

(*Monatshefte für practische Thierheilkunde.*)

ACUTE NASAL STENOSIS IN THE HORSE.

BY PROFESSOR E. ZSCHOKKE, ZURICH.

A MARE, aged 8, treated for intestinal catarrh, and having presented at different times signs of colic, was the subject of consultation. At the time there was very pronounced respiratory trouble; nostrils widely dilated, prostration intense, appetite *nil*. Pulse 120; temperature 40° C. The following day an intense dyspnœa, on account of acute nasal stenosis, threatened the animal with asphyxia. Mouth wide open, flanks heaving. Nasal mucous membrane cyanosed, and blood-tinged foam issuing from the nostrils. Tampons of wadding placed in the nasal cavities underwent hardly any displacement, showing that there was impermeability of the nasal fossæ. The buccal mucous membrane was pale, and the conjunctiva slightly injected. Asphyxia being imminent, tracheotomy was performed, but violent colic carried the animal off in a few hours.

Autopsy revealed aneurism, with thrombosis of the anterior mesenteric artery, as the cause of death. The heart and its valves were normal. What was the cause of the nasal stenosis? On examination of the nasal cavities it was easily accounted for, an intense hyperæmia of the mucous membrane of the tubes having caused complete obstruction of the nasal passages. It was impossible to tell whether this hyperæmia was venous, due to simple fatigue of the myocardium, or was of reflex origin. However it might be, nasal stenosis of this kind in the horse is very rare.

(*Schweizer Archiv für Tierheilkunde.*)

DOUBLE VENTRAL HERNIA; TUMOUR OF THE RIGHT MAMMÆ; OPERATION; CURE.

BY PROFESSOR VDRISKI, BUCHAREST.

A RATCATCHER'S dog exhibited an old ventral hernia and a tumour of recent date. The hernia was reducible, and situated to the left of the posterior mammary region; it reached almost to the ground. On the left, at the same level, there was a soft tumour the size of two fists, painless, with ulcerated foci discharging fœtid pus.

Operation was decided on. The patient was fixed in Claud Bernard's grooved table, and the region disinfected with sublimate. He was chloroformed. It was found that there was a double hernia on the right on a level with the tumour, and on the left above the tumour. The skin was detached, as in melon slicing, the region was very vascular, and the bleeding had to be controlled by pressure. The pedicle of the tumour was large, and was cut through with Chassaignac's écraseur.

"The hernial sac was opened at the side of the intestinal bulging; the lips of the sac were sutured and then those of the wound, and covered with sublimated collodion. The same procedure was practised on the left side."

The operation was well borne, and lasted one hour and ten minutes. After-procedure was simple. The disease was entirely cured nineteen days after the operation. The tumour was a carcinoma, 365 grammes in weight.—G. M.

(*Archiva Veterinaria.*)

Correspondence.

To the Editors of the VETERINARY JOURNAL.

SIRS,—Some ten years ago, foreseeing that meat inspection by qualified men would in time be general in this Empire, and being of opinion that the only men fit to qualify for such posts were members of our profession, I proposed in Council that powers be obtained to grant an additional diploma to those members who would specialize in the necessary subjects and sit for an examination. Unfortunately, and on this point many will agree with me, the attempt was unsuccessful, as it was maintained that our present diploma, which may be very comprehensive as regards the subjects in which the candidates are examined, but which on its face only bears a licence to practise veterinary medicine and surgery, was sufficient.

Yet, however much we may agree that it includes the knowledge of meat inspection, it is almost impossible to make town or city councillors believe this. In fact, for senior and even junior appointments reference is made in the public intimation to the fact that preference will be shown to those candidates who hold the diploma in State Public Health of Manchester University or the diploma in Veterinary Hygiene of the University of Liverpool.

At the present time, not only does the Royal Sanitary Institute grant certificates of proficiency in meat inspection, but in various parts of the country there are what may be called semi-private establishments, in which medical men (holding the D.P.H.), with the assistance of laymen (acting as local meat inspectors), hold classes, and grant certificates which are accepted by the municipal authorities in the surrounding districts. This certainly is not as it should be.

Furthermore, many of our own members, seeing the futility of applying for appointment with nothing but the diploma of the Royal College of Veterinary Surgeons, are taking the course and examination of the Royal Sanitary Institute.

I purpose at the next Council meeting to give notice of motion to the following effect:—"That in the interests both of the public and the profession, the time has now arrived when veterinary specialists should be appointed as meat inspectors, and that, in order to provide such specialists, the Council of the Royal College of Veterinary Surgeons be requested to make the necessary arrangements for the laying down of regulations for study and for examinations; such regulations to decide as to centres of education, times of examination, and amount of fees, &c."

The present position is quite anomalous for veterinary surgeons. They, of all men, have the most thorough knowledge of animals used for food, both whilst in life and after death, both in health and disease, and yet, forsooth, if they desire to practise that knowledge for the good of the public, they have to go to outside bodies to obtain the necessary qualifications.

I do not think it will be necessary to obtain a new charter, but that is a question for the lawyers to decide.

I am, Sirs, yours,

W. OWEN WILLIAMS.

School of Veterinary Medicine and Surgery, University of Liverpool.

August 25, 1908.

MORAL EDUCATION CONGRESS.

To the Editors of the VETERINARY JOURNAL.

SIRS,—We beg leave to draw the attention of your readers to the First International Moral Education Congress, to be held at the University of London, Imperial Institute Road, South Kensington, September 25 to 29.

The Congress is honoured by the good wishes of His Majesty the King. It meets under the patronage of twelve Ministers of Education, including England, the United States, France, Italy, Russia, Belgium, Spain and Japan. It has also for its patrons fifteen heads of Colonial Education Departments; delegates are being sent by many universities, by all the leading educational associations, and by a number of education authorities; and finally, the list of vice-presidents and of the General Committee includes very many of the leading educationists of Europe.

Of those who are contributing papers we may mention: England, Profs. Adams, Lloyd Morgan, Mackenzie, and Muirhead; America, Profs. Adler and Peabody; Italy, Cesare Lombroso; France, Profs. Buisson, Boutroux and Seailles; Germany, Profs. Munch, Foerster and Tonnies; Russia, M. and Mme. Kovalevsky; Hungary, Profs. Kármán and Schneller. The whole field of moral education in schools will be covered.

The following is the general programme :—

(1) The Principles of Moral Education. Chairman: The President.

(2) Aims, Means, and Limitations of the Varying Types of Schools. Chairman: The Right Hon. Lord Avebury, F.R.S.

(3) Character-building by Discipline, Influence, and Opportunity. Chairman: M. le Baron d'Estournelles de Constant (Senator).

(4) The Problems of Moral Instruction. Chairman: Prof. Dr. Friedrich Jodl (University of Vienna).

(5) (*a*) Relation of Religious Education to Moral Education. Chairman: Rev. Dr. Gow (Westminster School).

(*b*) Special Problems. Chairman: Regierungsrat Dr. Gobat (Berne).

(6) Systematic Moral Instruction. Chairman: Geheimrat Prof. Dr. Wilhelm Foerster (University of Berlin).

(*c*) The Teaching of Special Moral Subjects. Chairman: Cyril van Overbergh (Director-General of Higher Education for Belgium).

(7) The Relation of Moral Education to Education under Other Aspects. Chairman: Prof. Ferdinand Buisson (University of Paris).

(8) The Problem of Moral Education under Varying Conditions of Age and Opportunity. Chairman: The Rt. Hon. Sir William Anson, Bart. (University of Oxford).

(*d*) Biology and Moral Education. Chairman: Prince Jean de Tarchanoff (St. Petersburg Academy of Medicine).

Special Moral Instruction lessons will be given in English (Mr. F. J. Gould), in French (Pastor Charles Wagner, the author of "The Simple Life"), and in German (Frl. Jannasch.)

There will also be an exhibition of books and pictures.

The fee (including report of some 400 pages) is 10s. 6d. for the general public, and 7s. 6d. for teachers. Single-day tickets can be had for 2s. 6d. Return fares on all lines at single fare and a quarter.

It is hoped that there may be a large attendance of the general public and of the teaching profession.

Full details may be obtained on writing to the office of the Congress, 13, Buckingham Street, Strand, London, England.

We remain,

On behalf of the Executive Committee:

MICHAEL E. SADLER, *President.*
AVEBURY, *Hon. Treasurer.*
SOPHIE BRYANT, *Chairman.*
J. W. ADAMSON, *Vice-Chairman.*
GUSTAV SPILLER, *General Secretary.*

Books and Periodicals, &c., Received.

Journal of the Royal Army Medical Corps. Proceedings of the Royal Society of Medicine. Tropical Agriculturist (Ceylon). Report of the North Dakota Agricultural College. Annual Report of the Punjab Veterinary College. Bureau of Animal Industry, United States Department of Agriculture. The Practice of Equine Medicine, by F. T. Barton, M.R.C.V.S. (a handbook for students and practitioners, 15s. net., Messrs. Everett and Co., London). Ceylon Agricultural Society. Report of the Chief Veterinary Surgeon for the Cape of Good Hope. Oliphant's Law of Horses, by C. E. Lloyd, sixth edition (Sweet and Maxwell, Ltd., London).

Letters and Communications, &c.

Board of Agriculture; Department of Agriculture and Technical Instruction for Ireland; Professor W. Owen Williams; Professor W. L. Williams; Mr. Elton Bell; Mr. J. Cameron; Mr. G. Spiller; Dr. Antonio Pricolo (Gabinetto Batteriologico di veterinaria militare, Roma); Professor Taylor; Mr. C. Powell.

NOTE.—All communications should be addressed to 8, Henrietta Street, Covent Garden, London, W.C. Telephone, 4646 Gerrard. Telegrams, "Baillière, London."

Letters for the JOURNAL, literary contributions, reports, notices, books for review, exchanges, new instruments or materials, and all matter for publication (except advertisements), should be addressed to the Editor.

Manuscript—preferably type-written—should be on one side only of paper, marked with full name of author.

Illustrations for reproduction should be in good black or dark brown on white paper or card.

Advertisements and all business matters relating to the JOURNAL should be addressed to the publishers, Messrs. Baillière, Tindall and Cox.